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VIEW IN ADAMS COUNTY, TEN MILES S. W. OF HASTINGS.

PROCEEDINGS
OF THE
STATE HORTICULTURAL SOCIETY
OF
NEBRASKA,

AT MEETINGS HELD AT LINCOLN, NEBRASKA, ON JANUARY 10TH AND
FEBRUARY 7TH, 8TH, AND 9TH, 1877.

INTRODUCTORY.

BROWNVILLE, NEBRASKA, May 1st, 1877.

As President of the Nebraska State Horticultural Society, I have pleasure in submitting this report of our proceedings to the public; and especially for the information and guidance of settlers and farmers on the prairie, who will never realize the wealth, the beauty, and the fulness of a natural life on our fertile plains, until they make the orchard a part of their farms and have a due proportion of planted forest trees on their lands.

NEBRASKA NO EXPERIMENT.

We feel that the future of our State is secure. We know that the basis of an enduring prosperity has been laid broad and deep. Those of us who first crossed the Missouri and planted farms on its western shore hazarded a doubtful experiment, the result of which no one could foresee. The great plains were then a name of terror. They were given up to perpetual barrenness; and it was supposed that only the Indian who had been driven from the good lands as civilization advanced westward, could maintain existence in the inhospitable domain. A quarter of a century has

passed. We have known evil, and we have experienced good; and the good has far outweighed the ill. Those of us whose experience dates from the very beginning of Nebraska's civilized history, have seen step by step the progress of that change which is fast converting all her prairies from a buffalo range to a great farm and garden. But a great state is not made in twenty-five years; and we are only now at the beginning of our industrial development. Even in the eastern counties, there is ample room for improvement. We have space for thousands of new workers on our fertile lands, although we can claim that we have here subdued the prairie and brought it within the domain of civilization. We have tame grasses in our meadows; orchards and vineyards on our hills; abundant corn and wheat; and flocks and herds which are ever growing. Still there is here place for the

WORK OF THE STATE HORTICULTURAL SOCIETY.

With all the experience we have in the eastern counties, we find the benefit of our Society in the common counsel which is always helpful. But the farmers in the counties west, the Society can greatly aid. To many of them the prairie conditions are new. They want to set about planting trees and raising orchards; but they do not know how to commence the work to the best advantage. The Society can help them. We who are its oldest members have been taught by experience. We have learned manifold lessons by failure and by success; and the mistakes we have made they may avoid. It is the object of the Society to promote horticulture by setting forth the best methods, and by making the experiences of each horticulturist available for all. This is the motive for the publication of the report. In the subjoined pages a mass of useful information is gathered together, the careful study of which will repay the reader. In this introductory article it is not proposed to recapitulate the points raised, nor to discriminate where opinion conflicts. Experts in horticulture differ somewhat in their methods; but it will be found there is a general consent as to the conditions of the prairie, as regards horticulture and agriculture, and the difference is mainly as to the means to be adopted in adapting our work to our conditions. This is a great point gained. We are beginning to know for certain what we have to do in order to

COVER THE PRAIRIE WITH ORCHARDS AND PLANTED GROVES;

and this being so, one planter will accomplish success by one means, and another planter by another means. The greater matter is to perform honest, thorough, and careful work; and then not many years will elapse before—to the 100th meridian at least—we have orchards and forests proportioned to our needs. It is true that our prairie conditions are differentiated in different localities; but it is also true that it would be difficult to find, in the vast territory comprised in the United States, such general uniformity in any great tract of country as exists in Nebraska from the Missouri river to the 100th meridian. This pamphlet will fall into the hands of strangers as well as residents—strangers who are migrating from the crowded East to find homes among us on the fertile prairie; and for their benefit it will be well briefly to describe

THE PHYSICAL FEATURES OF NEBRASKA.

Who has not heard of the pure, life-giving air of the Rocky Mountains? In this respect this State comes within the mountain region. The great basin of the Mississippi ends on our eastern borders. The plains do not constitute a valley—in the common meaning of the word, they are not plains. They form the lowest eastern slope of the Rocky Mountains. On the western bank of the Missouri, the elevation of the land is 900 to 1,000 feet above the low water level of the Gulf of Mexico; and on the western border of Nebraska—a distance of about 400 miles—the elevation is 5,000 feet, or a mean of ten feet to the mile. Up to the 100th meridian the ascent is about eight feet in the mile—over the whole country a gradual ascent of eight feet per mile in direction west by north; and after the 100th meridian is passed the ascent is more rapid. The pure air of the mountains is thus the heritage of the plains. The drainage is perfect, and there are few swamps. Hence men are not enfeebled by malaria; hence vegetable life is not stunted and killed by mildew. To the middle of the State at least,

THE SOIL IS LARGELY OF ONE QUALITY.

Prof. Aughey, of the State University, and Prof. Hayden, have explained the geological processes by which

THE SURFACE DEPOSITS OF NEBRASKA

have been formed; and the most complete information on this subject may be found in Prof. Aughey's exhaustive paper on "The Superficial Deposits of Nebraska," published in the "Report of the United States Geological and Geographical Survey of the Territories for 1874," from which is extracted the following, explanatory of the subsoil of the greater portion of the State:

THE LOESS DEPOSIT.

The loess deposit is in some respects one of the most remarkable in the world. Its value for agricultural purposes is not exceeded anywhere. It prevails over at least three-fourths of the surface of Nebraska. It ranges in thickness from five to one hundred and fifty feet. Some sections of it in Dakota county measure over two hundred feet. At North Platte, 300 miles west of Omaha, and on the south side of the river, some of the sections that I measured ranged in thickness from one hundred and twenty-five to one hundred and fifty feet. From Crete, on the Burlington and Missouri River Railroad, west to Kearney, on the Union Pacific Railroad, its thickness for 90 miles ranges from 40 to 90 feet. South of Kearney, and for a great distance west, along the Union Pacific Railroad, as far as to the Republican, there is a great expanse of territory, covered by a great thickness of this deposit. I measured many sections in wells over this region, and seldom found it less than forty, and often more than sixty feet in thickness. Along the Republican, I traced the formation almost to the western line of the State, its thickness ranging from thirty to seventy feet. One section north of Kearney, on Wood river, showed a thickness of fifty feet. The same variation in thickness is found in the counties bordering on the Missouri. One peculiarity of this deposit is, that it is almost perfectly homogeneous throughout, and of almost uniform color, however thick the deposit or far apart the specimens have been taken. I have compared many specimens taken 300 miles apart, and from the top and bottom of the deposits, and no difference could be detected by the eye or by chemical analysis.

CHEMICAL COMPOSITION OF SUBSOIL.

Over 80 per cent. of this deposit is very finely comminuted silica. When washed in water, left standing, and the water poured off, and the coarser materials have settled, the residuum, after evaporation to dryness, is almost entirely composed of fine siliceous powder. So fine, indeed, are the particles of silica that its true character can alone be detected by analysis, or under a microscope. About 10 per cent. is composed of the carbonates and phosphates of lime. These materials are so abundant in these deposits that they spontaneously crystallize, or form concretions, from the size of a shot to that of a walnut; and these are often hollow, or contain some organic matter, as a fossil, around which the crystallization took place. * * This deposit also contains small amounts of alkaline matter, iron, and alumina. For the purpose of showing the homogene-

ous character and the chemical properties of the loess deposits, I have made five new analyses of this soil. No. 1 is from Douglas county, near Omaha; No. 2 from the bluffs, near Kearney; No. 3 is from the Lower Loup; No. 4 from Sutton; and No. 5 from the Republican Valley, near Orleans, in Harlan county.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Insoluble (siliceous) matter.....	81.28	81.32	81.35	81.30	81.32
Ferric oxide.....	3.86	3.87	3.83	3.85	3.86
Alumina.....	.75	.75	.74	.73	.74
Lime, carbonate.....	6.07	6.06	6.03	6.05	6.09
Lime, phosphate.....	3.58	3.59	3.58	3.57	3.59
Magnesia, carbonate.....	1.29	1.28	1.31	1.31	1.29
Potassa	.27	.29	.35	.34	.33
Soda	.15	.16	.14	.16	.16
Organic matter.....	1.07	1.06	1.05	1.06	1.06
Moisture	1.09	1.08	1.09	1.08	1.09
Loss in analysis.....	.59	.54	.53	.55	.47
	100.00	100.00	100.00	100.00	100.00

For the purpose of comparison, I here reproduce, from Hayden's report, Bischoff's analysis of the Lacustrine or Loess of the Rhine:

	No. of Analysis.				
	1.	2.	3.	4.	5.
Silicic acid.....	58.97	79.53	78.63	62.43	81.04
Alumina	9.97	13.45 }		7.51	9.75
Peroxide of iron.....	5.25	4.81 }	15.26	5.14	6.67
Lime.....	0.02	0.02	.....	.....	.....
Magnesia.....	0.04	0.06	0.09	0.21	0.27
Potash	0.11	1.05 }			
Soda	0.84	1.14 }	3.31	1.75	2.27
Carbonate of lime.....	20.16	.....	.....	11.63	.....
Carbonate of magnesia	4.21	.....	.....	3.02	.....
Loss by ignition	1.37	.....	1.89	2.31	.....

It will be seen from the above analyses of Bischoff that Nos. 3 and 5, in the quantity of silica and other elements that are present, come very near the Loess of Nebraska. The principal difference is the larger quantity of alumina present in the samples analyzed by Bischoff. Chemically the deposits of the Rhine Valley, as Hayden remarks, are not essentially different from those of the Loess soils along the Missouri. As would be expected, from the elements which chemical analysis shows to be present in these deposits, it forms

ONE OF THE BEST SOILS IN THE WORLD.

In fact, it can never be exhausted until every hill and valley of which it is composed is entirely worn away. Its drainage, which is the best possible, is owing to the remarkably finely-comminuted silica of which the bulk of the deposit consists. Where the ground is cultivated the most copious rains soon percolate through the soil, which in its lowest depths, retains it like a huge sponge. Even the unbroken prairie absorbs much of the heavy rains that fall. When droughts come the moisture comes up from below by capillary attraction. And when it is considered that the depth to the solid rock ranges generally from five to two hundred feet, it is seen how readily the needs of vegetation are supplied in the driest seasons. This is the main reason why over all the region where these deposits prevail

THE NATURAL VEGETATION AND THE WELL CULTIVATED CROPS

are rarely dried out or drowned out. I have frequently observed a few showers to fall in April, and then no more rain until June, when, as will be considered further on, there is generally a rainy season of from two to four weeks' continuance. After these June rains little more would fall till autumn; and yet, if there was deep and thorough cultivation, the crops of corn, cereals, and grass would be most abundant. This condition represents the dry seasons. On the other hand, the extremely wet seasons only damage the crops over the low bottoms, subject to overflow. Owing to the siliceous nature of the soils they never bake when plowed in a wet condition, and a day after heavy rains the plow can again be successfully and safely used. The

PHYSICAL PROPERTIES OF THE LOESS

deposits are also remarkable. In the interior, away from the Missouri, hundreds of miles of these loess deposits are almost level or gently rolling. Not unfrequently a region will be reached where, for a few miles, the country is bluff or hilly, and then as much almost entirely level, with intermediate forms. The bluffs that border the flood-plains of the Missouri, the Lower Platte, and some other streams are sometimes gently rounded off. They often assume fantastic forms, as if carved by some curious generations of the past. But now they retain their forms so unchanged from year to year, affected neither by rain nor frost, that they must have been molded into their present outlines under circumstances of climate and level very different from that which now prevails. For all purposes of architecture this soil, even for the most massive structures, is perfectly secure. On no other deposits, except the solid rocks, are there such excellent roads. From twelve to twenty-four hours after the heaviest rains the roads are perfectly dry, and often appear, after being traveled a few days, like a vast floor formed from cement, and by the highest art of man. Yet the soil is very easily worked, yielding readily to the spade or the plow. Excavation is remarkably easy, and no pick or mattock is thought of for such purposes. It might be expected that such a soil readily yielded to atmospheric influences, but such is not the case. Wells in this deposit are frequently walled up only to a

point above the water-line; and on the remainder the spade-marks will be visible for years. These peculiarities of the loess deposits are chiefly owing to the fact that the carbonate of lime has entered into slight chemical combination with the finely comminuted silica. There is always more or less carbonic acid in the atmosphere which is brought down by the rains, and this dissolves the carbonate of lime, which then readily unites with the silica, but only to a slight extent, and not enough to destroy its porosity. Though much of the silica is microscopically minute, it has largely preserved its angular structure, and this of course aids the slight chemical union that takes place between it and the carbonate of lime. Had there been more lime and iron in this deposit, and had it been subjected to a greater and longer pressure from superincumbent waters, instead of a slightly chemically compacted soil it would have resulted in a sandstone formation incapable of cultivation. There is not enough clayey matter present to prevent the water from percolating through it as perfectly as through sand, though a great deal more slowly. This same peculiarity causes ponds and stagnant water to be rare within the limits of this deposit. In these Loess deposits are found the explanation of the ease with which nature produces

THE WILD FRUITS IN NEBRASKA.

So dense are the thickets of wild grapes and plums along some of the bottoms and bluffs of the larger streams that it is difficult to penetrate them. Over twenty varieties of wild plums have been observed, all of them having originated either from *prunus americana*, *p. chickasa*, or *p. permillo*. Only two species of grapes are clearly outlined, namely: *vitis aestivalis* and *v. cordifolia*, but these have such interminable variations that the botanist becomes discouraged in attempting to draw the lines between them, and to define the range and limit of the varieties. The same remark could be made of the strawberries. Raspberries and blackberries abound in many parts of the State. The buffalo-berry (*Shepherdia canadensis*) is common on many of the Missouri and Republican river bottoms. Many other wild fruits abound, and grow with wonderful luxuriance wherever timber protects them and prairie-fires are repressed. As would be expected, these deposits are also a paradise for the cultivated fruits of the temperate zones. They luxuriate in a soil like this, which has perfect natural drainage, and is composed of such materials. No other region, except

THE VALLEYS OF THE NILE AND OF THE RHINE,

can, in these respects, compare with the Loess deposits of Nebraska. The Loess of the Rhine supplies Europe with some of its finest wines and grapes. The success that has already attended the cultivation of the grape, in South-eastern Nebraska, at least, demonstrates that the State may likewise become remarkable in this respect. For the cultivation of the apple its superiority is demonstrated. Nebraska, although so young in years, has taken the premium over all the other states in the pomological fairs at Richmond and Boston. Of course there are obstacles here in the way of the pomologist as well as in other favored regions. But what is claimed is, that the soil, as analysis and experience prove, is eminently adapted to grape, and especially to apple-tree, culture.

This long extract gives the *rationale* of fruit culture in Nebraska. The results attained in the river counties can be accomplished elsewhere. There are differences of course. One locality has advantages over another in certain directions, and in certain respects; and experience will be the guide in every county. But the general features are the same. On the bluffs in Nemaha, Otoe, and other river counties, our orchards and vineyards obtain their most perfect growth. But, as we see, the soil which assures this success is the common soil of the State; and the bluffs of the Missouri are repeated in the country which borders on the Republican river. The subsoil is the same, and so is the surface soil—the

BLACK SURFACE SOIL

which is a rich admixture of loess or alluvion with organic matter. Then, the climate is the same;* and

THE AVERAGE RAINFALL

does not much vary over the entire area up to the 100th meridian. There is a little advantage in this respect in the river counties; but even now it is not large, and observations extending over a series of years show that

AS THE PRAIRIE IS CULTIVATED THE RAINFALL INCREASES.

To demonstrate this position would occupy too much space; and I must content myself with a summary of tables made up a few years ago, and which showed the rainfall of the State for a period of five years. Dividing the year into three parts, the figures gave for the winter months of December, January, and February 5.23 inches; for the spring and fall months of March, October, and

* The following is derived from a series of observations made for eight years by Mr. A. L. Childs, of Plattsmouth: In Cass County, the prairie grass begins to show green from about the middle of March to April 10, and will support cattle from about the middle of April to about May 10; willows are green before the end of April or in the beginning of May; wild plums are ripe during August; wild cherries early in July; violets in bloom in April; and apples bloom from May 1st to the 28th. Birds appear—the robin from the middle to the end of March; wrens and cat-birds the close of April and beginning of May; and bobolinks and swallows from about the beginning of May to about the middle of May.—R. W. F.



VIEW TEN MILES SOUTH OF ALBION, BOONE COUNTY, NEBRASKA.

November 5.40 inches; and for the six remaining agricultural months an average total for each year of 23.21 inches. Thus the rain falls when it is needed. Thus the clouds irrigate Nebraska, giving the entire State (up to the western border 5,000 feet above sea level), an average annual total of 33.84 inches, which is only seven inches less than the rainfall of Iowa, while the average for the agricultural months is about the same. And, of course, the rainfall is larger east of the 100th meridian than it is west.

NEBRASKA IS ABUNDANTLY WATERED.

Every traveler through the State remarks its numerous streams. On this head Prof. Aughey writes:

There are large areas of the State where running water can be found on every section, and often on every quarter-section of land. Where such water resources do not exist, it can easily be obtained by digging or boring to a certain depth. In the loess deposits water is frequently found at a depth of from fifteen to forty-five feet. If this proves a failure, as it occasionally does, water can be obtained beneath, in the drift; or, where this is absent, when the underlying rocks are reached. At the bottom of the loess deposits there is generally a layer of sand or gravel, which is a great reservoir of water, and from which it flows in unlimited quantities. In some of the counties drained by the Blue rivers and their tributaries, but rarely east of them, where the loess deposits are very thick, water is not found until this stratum of sand and gravel is struck, at a depth of from sixty to one hundred and twenty feet. I have known of only a few instances where the underlying rocks had to be penetrated to secure permanent water. This underlying bed of sand and gravel is, as before observed, probably drift, and exists, at some depth, over the greater part of the State. An interesting phenomenon connected with the Platte and Republican rivers, is the drainage of a portion of the waters of the former into the latter. The Platte flows eastward, at a considerably higher level than the Republican, and between the two, rivers there is a large area of loess, underlaid by drift, sand, and gravel, which in many places is continuous between the two rivers. Through this drift, sand and gravel, the waters of the Platte, where they run over it, flow into the Republican. The two rivers are, in the main, parallel, and, at the meridian of Kearney Junction, are only forty miles apart. In traveling along the Republican for a hundred miles, from Orleans westward, and by wading in the river for miles at a time, I observed such a quantity of water trickling through these sands near the water's edge, in hundreds of places, that it could not possibly all have come from the superficial deposits. It was during the dry season (August) of 1874, that I made these examinations. Occasionally, where this underlying bed of sand and gravel lies on clay or rock, subterranean currents are formed*

* It may be going a little out of the way in a horticultural report to refer to pisciculture, but still it is not an improper subject for a brief note while the water resources of Nebraska are under consideration. There are sufficient clear rivers and creeks, and

Rich in these natural advantages, and with a health-giving, life-sustaining climate—health-giving and life-sustaining for vegetable as well as animal life—whenever the cultivator works intelligently the result will be success. It is probable that the largest interest of the State will be

STOCK RAISING.

The market which is opened in England for American beef and mutton assures the future of the live stock grower of the plains. When fat steers weighing 1,500 to 1,800 pounds can be grown in the strictly agricultural portion of the State at a cost of $2\frac{1}{2}$ cents per lb. there need be no doubt but that the stock raisers will be able to compete, in the markets of the East and England, with those of any other section of the country or of the world. But, while this is so, neither horticulture nor arboriculture should, or will, be neglected.

FRUIT IS ESSENTIAL AS FOOD,

and it must be had either by being grown at home or by importation. In the older settled portions of the State we are now independent of imported fruit; and in due time the newer settled counties will be independent also. The aspiration of Henry IV. of France was for a chicken for the pot of every peasant. The State Horticultural Society of Nebraska would help forward the time when every Nebraska farmer will have his orchard and vineyard—and not only his orchard but his

GROVES OF PLANTED TREES,

which will not only beautify his home but supply all the fuel and lumber that he needs. There is a current fallacy that the prairies are treeless; and those who entertain the notion will be surprised to learn that

in some parts small lakes—and everywhere ponds—to make certain species of fresh water fish forever abundant in the State. In some places trout could be cultivated successfully; but, perhaps, the most useful fish in most of the prairie streams and sloughs would be the black bass. A few years ago a consignment of fish (perch, bass, pickerel, &c.) were being sent over the Union Pacific Railroad to California. By an accident, the car in which they were being transported was overturned into the Elkhorn river, and the young fish got into the stream. They have multiplied there amazingly; but settlers are credited with catching all that came to the net, regardless of the size of the fish and the wants of the future. The State has some useful laws on the subject; but it might be well to enact a general law to promote the systematic stocking of our waters.—R. W. F.

THE NATIVE SYLVA

includes the following trees: Ohio buckeye, *æsculus glabra*; sweet buckeye, *æsculus flava*; red maple, *acer rubrum*; sugar maple, *a. saccharinum*, box-elder, or ash leaved maple, *negundo aceroides*; honey locust, *gleditsia tricanthus*; water locust, *g. menosperma*; white ash, *fraxinus americanus*; red ash, *f. pubescens*; green ash, *f. virides*; blue ash, *f. quadrangulata*; red elm, *ulmus fulva*; white elm, *u. americana*; cork elm, *u. racemosa*; wahoo elm, *u. alata*; hackberry, *celtis occidentalis*; plane tree, or sycamore, *platanus occidentalis*; black walnut, *juglans nigra*; shag bark hickory, *carya alba*; nockernut hickory, *c. tomentosa*; pignut hickory, *c. porcina*; butternut hickory, *c. amara*; oaks (11 species), *quercus*; ironwood, *carpinus americana*; paper birch, *betula papyracea*, and two other birches, the *pumila* and *occidentalis*; willow, *salix*, of which there are four tree species and eight shrubs; water poplar, *populus angulata*; cottonwood poplar, *p. monilifera*; balsam poplar, *p. balsamifera*; yellow pine, *pinus ponderosa*; white cedar, *cupressus thyoides*; red cedar, *juniperus virginiana*; and two spruce firs, *abies englemanni*, and *douglassi*. The shrubs include the common juniper, *juniperus communis*; papaw, *asimina triloba*; linden, *tilia americana* var. *pubescens*; prickly ash, *santhoxylum americanum*; shrub trefoil, *ptelea trifoliata*; five sumacs, *rhus typhina*, *r. glabra*, *r. copallina*, *r. toxicodendron*, and *r. aromatica*; buck thorn, *ramnus alnifolius*; red root, *ceanothus americanus*, and *c. ovalis*; spindle tree, *euonymus atropurpureus*, *e. americanus*, and *e. ovalis*; six species of plums, *prunus americana*, *p. chicasa*, *p. pumila*, *p. pennsylvanica*, *p. virginiana*, and *p. serotina*; six currants and gooseberries, *ribes cynobasti*, *r. hirtellum*, *r. rotundifolium*, *r. lacustre*, *r. floridum*, *r. aoreum*; five dogwoods, *cornus canadensis*, *c. circinata*, *c. sencea*, *c. stolonifera*, and *c. asperfolia*; butterbush, *cephalanthus occidentalis*; buffalo berry, *shepherdia canadensis* and *s. argenta*; red mulberry, *morus vulva*; white mulberry, *m. alba*; hazelnut, *corylus americana*, and beaked hazelnut, *c. rostrata*. During the Indian period when prairie fires annually swept over the country, the timber was confined to the banks of the streams. Now that the era of civilization and cultivation has commenced, the prairie fires are checked, and groves and even forests have become possible on the prairie. Every farmer can plant, and

IF THE PLANTER SELECTS NATIVE TREES,

soil, climate, and hereditary habits of growth—for these affect plants as well as animals—are all in his favor. The list is large enough for a good selection, and there is no sound reason why every farmer should not be a tree grower.

The Hon. J. Sterling Morton, of Nebraska City, to whom the horticulturists and arboriculturists of Nebraska owe much, says:

TREE PLANTING IS AN AVOCATION

which barbarians never follow. It may seem a long task to raise a saw log from the walnut which lies on the palm of your hand. But the rain and the frost of winter, and the sunshine of summer, together with the fertile and forcing soil of Nebraska, crowd a walnut into the dimensions of a respectable saw log in less than twenty-five years. Upon a farm where I have lived in Otoe county for more than twenty years, one may see black walnut trees which will make good railroad ties, and some which will do to saw up, which I have planted with my own hands. There, too, are apple trees, more than forty inches in circumference of trunk, which have borne more than twenty bushels of fruit in a single season, and again, there may be found cottonwood saw logs growing there, which are more than six feet in girth, and when I first saw them they were only wandering germs, floating in the air like down from a bird's breast.

Out of my experience in my own nurseries at Brownville, I may say the same—certainly may speak words of encouragement to those who are beginning the task, which is an old task to Mr. Morton and myself. But the facts are encouragement sufficient. There are no general national exhibits of timber; but in the

NATIONAL EXHIBITS OF FRUITS

our young State takes the first rank. Three times she has been awarded first prizes at the biennial exhibition of the National Pomological Society—at Richmond, Boston, and Chicago—in competition with the whole country; and at

THE CENTENNIAL EXHIBITION

at Philadelphia, 1876, besides a general award to the State for excellence of soil and general productions, the State Horticultural Society received two awards. We know that the throng of visitors to the exposition were specially attracted by our fruits exhibited in Pomological Hall; and also at the general exhibit of the State in

the Agricultural Hall. The opinion of the public has been confirmed by the judges as the following certificates received by the Society indicate:

INTERNATIONAL EXHIBITION, 1876.

Philadelphia, March 27, 1877.

NEBRASKA STATE HORTICULTURAL SOCIETY.

[2 Reports.]

SIR:

The enclosed is a certified copy of the Report of the Judges, as accepted by the United States Centennial Exposition, and in conformity with which an award was decreed to you.

You will be notified when the Diploma and Medal are ready for delivery.

Please acknowledge the receipt of this report.

Yours respectfully,

(Signed)

A. T. GOSHORN,

Director-General.

PEARS—LARGE, SMOOTH, AND WELL COLORED.

INTERNATIONAL EXHIBITION.

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

Philadelphia, February 20th, 1877.

REPORT ON AWARDS.

PRODUCT.—Pears.

NAME AND ADDRESS OF EXHIBITOR.—Nebraska State Horticultural Society, Nebraska.

The undersigned having examined the product herein described, respectfully recommend the same to the United States Centennial Commission for award, for the following reasons, viz.:

For eight varieties of pears, shown without the name of the grower, but all well grown. The Flemish Beauty, Louise bonne de Jersey, White Doyenne, and Duchess d'Angouleme are superior specimens, large, smooth, and well colored.

PARKER EARLE.

Signature of the Judge.

APPROVAL OF GROUP JUDGES.

W. L. Schaffer,
E. T. Lyon,
Suel Foster,
Josiah Hoopes,

E. Satterthwait,
A. W. Harrison,
Thomas Meehan,
J. B. Yellowby,

William Barry.

A true copy of the record.

[Seal.]

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN,
Director-General.

J. L. CAMPBELL,
Secretary.

J. R. HAWLEY,
President.

AN UNUSUALLY FINELY GROWN COLLECTION OF APPLES—263 VARIETIES.

INTERNATIONAL EXHIBITION,

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

Philadelphia, February 13th, 1867.

REPORT ON AWARDS.

PRODUCT.—Two hundred and sixty-three varieties of apples.

The undersigned having examined the product herein described respectfully recommend the same to the United States Centennial Commission for award, for the following reasons, viz:

For a remarkably fine collection, and for the unusually large number of finely grown varieties; also for their general freedom from insect markings, fungus, and weather discolorations.

SUEL FOSTER.

Signature of the Judge.

APPROVAL OF GROUP JUDGES.

A. W. Harrison,
E. Satterthwait,
Josiah Hoopes,
William Parry,

J. B. Yellowby,
Parker Earle,
T. T. Lyon,
W. L. Schaffer,

Thomas Meehan.

A true copy of the record.

[Seal.]

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN,

Director General.

J. L. CAMPBELL,

Secretary.

J. R. HAWLEY,

President.

THE VIEWS OF NEBRASKA LANDSCAPES

with which this pamphlet is enriched, represent the scenery and contours of the country north and south of the Platte river. The plates have been lent by Mr. A. E. Touzalin, Land Commissioner of the Burlington and Missouri River Railroad Company, Lincoln, Nebraska.*

ROBT. W. FURNAS,

Pres't Neb. State Hort. Society.

* For full information with regard to Nebraska, see *Nebraska: its Advantages, Resources, etc.*, by Edw. A. Curley (author of the *True Story of the Black Hills*), 29 Tompkin's Street, Chicago, published by the American and Foreign Publication Company, 137 Eighth Street, New York; and the American News Company, Nassau Street, New York; *Geological Survey of the Territories*, by Professor Hayden; and the *Circulars of the Union Pacific*, and *Burlington and Missouri River Railroad Companies*, which latter will be furnished free on application to the Land Commissioner of the B. & M. at Lincoln, and the Land Commissioner of the U. P. at Omaha.

PROCEEDINGS AT THE ANNUAL MEETING OF THE STATE HORTICULTURAL SOCIETY.

LINCOLN, NEB., January 10, 1877.

Annual meeting of the Society convened pursuant to call, President Hobson being absent, Robt. W. Furnas was called to the chair. Election of officers took place with the following result:

Robt. W. Furnas, Brownville, President.

E. N. Grennell, Ft. Calhoun, 1st Vice President.

C. Mathewson, Norfolk, 2d “ “

D. H. Wheeler, Plattsmouth, Secretary.

John Evans, Omaha, Treasurer.

Voted, That the following gentlemen, in connection with the officers above, constitute the Board of Directors for the Society:

E. F. Stephens, Crete; Perry Walker, Plattsmouth; James S. Stewart, Blair.

Voted, To amend By-Laws—that \$5 paid in advance shall constitute membership for six years.

Appointed:—Committee to prepare Premium Lists for Fair in September next: Robt. W. Furnas, E. F. Stephens, Perry Walker.

Appointed:—Committee to confer with Agricultural Committees of the Legislature as to legislation required to further the interests of Horticulture in the State: Perry Walker, Chas. Mathewson, D. H. Wheeler.

Appointed:—Committee on programme for next meeting: E. N. Grennell, E. F. Stephens, with instructions to invite all interested to be present and participate in discussions, or report by communication.

Voted, To adjourn annual meeting to Lincoln, February 7th, 1877.

ADJOURNED MEETING.

The Society met pursuant to adjournment at Lincoln, on February 7th, 1877, and continued in session, day by day, to February 9th. Present—Robt. W. Furnas, President, D. H. Wheeler, Secretary, a quorum of members, with an unusually large number of persons from various parts of the State, interested in horticultural



VIEW ON TAYLOR CREEK, MADISON COUNTY, NEBRASKA.

advancement. Interesting reports were received from various portions of the State, which are condensed, and divided so as to come under their appropriate headings, with the discussions which occurred on the reports. Oscar A. Mullon, reporter of the Second Judicial District, and an enthusiastic laborer in the agricultural and horticultural interests of the State, was present, and assisted in the preparation of this report.

FINANCES OF THE SOCIETY.

The following bills were audited, and allowed:

State Journal, printing cards and letter-heads.....	\$14.00
Nebraska Advertiser, printing envelopes.....	5.00
O. A. Mullon, reporter.....	15.00

Report of Treasurer, as follows, was presented and approved:

TREASURER'S OFFICE,
OMAHA, NEB., January 8th, 1877. }

JOHN EVANS, *Treasurer*,

In account with NEBRASKA STATE HORTICULTURAL SOCIETY.

1876.		Dr.
January 27—To balance in treasury, per report.....	\$1,105.55	
To cash received for 22 membership fees.	22.00	
		\$1,127.55
1876.		
January 29—By cash paid Order No. 3, J. T.		
Allen.....	\$ 25.00	
August 29—By cash paid Order No. 4, to M.		
P. Wilder for Pomological So-		
ciety's Journal	20.25	
August 29—Cash paid Order No. 5, to S. B.		
Hobson, for expense of dele-		
gation to Centennial.....	600.00	\$645.25
1877.		
January 8—To balance in treasury.....		\$482.30

Respectfully submitted,

JOHN EVANS,
Treasurer.

The following report of the Secretary was presented, and approved:

D. H. WHEELER,

In account with the STATE HORTICULTURAL SOCIETY.

Order No. 3, J. T. Allen.....	\$ 25.00
“ “ 4, M. P. Wilder.....	20.25
“ “ 5, S. B. Hobson.....	600.00

Order No. 5, issued to S. B. Hobson, was drawn by direction of the State Horticultural Society, for the purpose of making Centennial exhibition, and was used as follows:

Given to H. Craig.....	\$100.00
“ S. B. Hobson.....	100.00
“ P. L. Wise.....	60.00
“ James W. Moore.....	325.00
“ A. L. Brown (apples).....	1.00
“ Isaac Wiles.....	3.00
“ Stephen Wiles.....	1.25
“ Perry Walker.....	4.50
“ R. M. Barker.....	1.75
“ J. F. Doud.....	2.00
“ Lucy A. Austin.....	1.90
“ S. S. Billings.....	1.25
“ L. A. Moore.....	4.10
“ L. M. Wright.....	4.00
“ Joseph Leesley.....	.75
“ J. P. Young.....	2.00
“ E. G. Dovey (barrels).....	3.20
“ J. H. Buttery “.....	.40
“ J. V. Weckbach “.....	.60
“ P. L. Wise (help).....	6.00
“ W. D. Jones (team).....	10.50

\$633.20

Received from memberships in June, 1876..... 9.00

\$624.20

Balance due Wheeler..... 24.20

HONORARY MEMBERSHIP.

The following eminent Horticulturists and Pomologists of other States were voted honorary and life members of the Nebraska State Horticultural Society:

Marshall P. Wilder, Boston, Mass.
Chas. Downing, Newburg, New York.
Jno. A. Warder, Cleves, Ohio.
G. B. F. Leighton, Norfolk, Virginia.
P. T. Quinn, Newark, New Jersey.
P. J. Berckmans, Augusta, Georgia.
Arthur Bryant, Sr., Princeton, Ill.
C. C. Langdon, Mobile, Ala.
Wm. Saunders, Washington, D. C.
P. P. Bishop, San Mateo, Florida.
Allen Furnas, Danville, Ind.
J. C. Plumb, Milton, Wis.
Suel Foster, Muscatine, Iowa.
Robert Buist, Philadelphia, Penn.
N. C. Meeker, Greeley, Colorado.
C. V. Riley, St. Louis, Mo.
Wm. Howsley, Leavenworth, Kansas.
C. C. Hamilton, Cornwallis, Nova Scotia.
Robt. Burnett, Hamilton, Ontario.
J. E. Johnson, St. George, Utah.
A. J. Dufur, Portland, Oregon.
B. S. Fox, San Jose, California.
D. Redmond, Ocean Springs, Miss.

SPECIAL COMMITTEES ON SPECIAL SUBJECTS.

The Society appointed Special Committees whose reports are to be made to the next annual meeting; and it may fairly be anticipated that these reports will be exceedingly valuable in promoting the Horticultural and Arboricultural interests of the State. In the

first place a committee of five was constituted for each Judicial District of the State, whose duty it will be to report on the condition of fruits, progress in their culture, or any other topic affecting their respective districts. These committees were as follows:

FIRST DISTRICT.

Samuel Barnard, chairman, Table Rock, Pawnee county.

E. F. Stephens, Crete, Saline county.

J. W. Meserve, Beatrice, Gage county.

— Beckwith, Humboldt, Richardson county.

J. B. Dinsmore, Sutton, Clay county.

SECOND DISTRICT.

S. R. Thompson, chairman, Lincoln, Lancaster county.

A. Donahoo, Nebraska City, Otoe county.

C. N. Winslow, Mt. Pleasant, Cass county.

Benton Aldrich, Clifton, Nemaha county.

J. M. Madison, Nebraska City, Otoe county.

THIRD DISTRICT.

J. S. Bowen, chairman, Blair, Washington county.

E. D. Canfield, Decatur, Burt county.

J. H. Rohwer, Ft. Calhoun, Washington county.

John Evans, Omaha, Douglas county.

Geo. A. McCoy, Omaha, Douglas county.

FOURTH DISTRICT.

J. T. Clarkson, chairman, Schuyler, Colfax county.

Wm. Stolley, Grand Island, Hall county.

N. S. Belden, Fremont, Dodge county.

A. E. Jenks, Ashland, Saunders county.

E. M. Spear, Seward, Seward county.

FIFTH DISTRICT.

A. D. Williams, chairman, Kenesaw, Adams county.

M. S. Budlong, Amazon, Franklin county.

J. T. Gilman, Osco, Kearney county.
B. N. Mills, Republican City, Harlan county.
E. Kellogg, Red Cloud, Webster county.

SIXTH DISTRICT.

U. Bruner, chairman, West Point, Cuming county.
Wm. Taylor, Dakota, Dakota county.
John Olney, Norfolk, Madison county.
C. C. Van, St. James, Cedar county.
E. W. Arnold, Ponca, Dixon county.

There was also appointed the following committee of three on *Synonyms*, for the State at large:

James H. Masters, chairman, Nebraska City, Otoe county.
Stephen Hobson, Mt. Pleasant, Cass county.
Samuel Barnard, Table Rock, Pawnee county.

Also a committee of one on each of the following:

Meteorology in its relations to Horticulture—Prof. G. E. Bailey, State University, Lincoln.

Entomology in its relations to Horticulture—Prof. S. Aughey, Ph.D. and M.A., State University, Lincoln.

Ornithology in its relations to Horticulture—Prof. Harvey Culbertson, B.A., State University, and College Farm, Lincoln.

Geology in its relations to Horticulture—Prof. C. D. Wilbur, Wilbur.

Forestry in its relations to Horticulture—James T. Allen, Omaha.

Vegetable Culture—Azro Smith, Plattsmouth.

Ornamental Gardening—E. H. Burches, Brownville.

HORTICULTURE IN NEBRASKA.

The above formal business having been transacted, the Society proceeded to discuss matters of interest to the horticulturists of the State. Numerous valuable reports were presented and received;

and discussions ensued on the questions raised. In dealing with these reports and discussions, they have been separated into subjects so as to present the valuable information they furnish in such form as will make it ready for reference. In the first place the purely horticultural portions are collected, and follow hereon, the order followed being to take the South Platte country by counties, from east to west; and then the North Platte country from west to east. In the first place comes

CASS COUNTY.

LEAN TREES TO THE SOUTH-WEST.

Mr. Perry Walker, writing from Plattsmouth, says:

I cannot state positively how many fruit trees there are in Cass county, but I should say there are 75,000 forest trees. Most of the farmers that have homes of their own have cottonwood, maple, ash, and elm planted. There has been but one failure of apples with me in thirteen years. Peaches are uncertain. In planting apple trees, I lean them to the south-west, to prevent them from getting sun-burnt. Trees with good roots are about as sure to grow as good seed-corn.

OTOE COUNTY.

J. W. Pearman, of Nebraska City, Otoe county, thus reports:

Although in its infancy, so to speak, it is indeed surprising to see what a reputation this State has gained both at home and abroad, for producing such fine

HEALTHY FRUITS

as she has had on exhibition at the State and National Fairs held in the United States, and the grand display she made at the Centennial exhibition at Philadelphia, and that too at a cost to her people not exceeding *one thousand dollars*, while our sister States,

Kansas and Missouri, spent thousands upon thousands of dollars to make their horticultural display at the same place.

The fact is the same varieties of apples produced in Michigan, Ohio, Indiana, Illinois, and Kentucky, that we grow in Nebraska, have altogether a different look, color and flavor. The former are rough, scrubby, and somewhat ancient looking, like many of the residents thereof, while the latter have a smooth, tender appearance, young crisp and juicy, full of health, and quite attractive, similar to the young and middle-aged people of Nebraska. Now in order to prove what I here assert, permit me to call the attention of those in attendance at the Legislature last winter. They will remember Mr. Lew Franklin, of the Lincoln Tea Store, who had charge of the refreshment department, had a supply of Nebraska grown fruit in the rotunda of the Capitol. Most of the time he had on sale Otoe county apples, and the demand for those apples was greater than the supply, and occasionally Michigan apples were put on sale, but in no case found such ready buyers as those produced in Nebraska. I was present nearly all the time, and noticed with pleasure the preference the Nebraska grown apples had over those produced in the older states, and that too by persons who knew no more about the different varieties of apples growing in the country than a Granger does about seeking office under the new administration. Now the question may be very properly asked why is it that

NEBRASKA FRUITS

are more highly flavored, much handsomer and keep longer than apples of the same varieties produced in the states before mentioned? This question I have asked myself time and again, and so far have had no more satisfactory explanation given than my own theory on the subject; and my theory is that in the first place we have healthy soil and climate in which to grow healthy trees, and wherever the tree is healthy the fruit thereof cannot be otherwise. This theory I believe holds good in the human family and animal creation; and if that is true, the same theory will hold good in the vegetable creation. Then again from the first of July to the first of November—during which time our fruits mature—we are blessed with a healthy atmosphere, such as but few states can boast of.

PURE AIR, AND NO MILDEW.

Situated as we are, right at the base of the Rocky Mountains, where the air is pure and light, where mildew is never seen, and the insects incident to a damp climate are strangers to the land, it is no wonder that Nebraska fruits look brighter, healthier, and are of much better flavor than fruits of the same kind produced in the eastern or middle states. The nearer we can grow apples to the Rocky Mountains the better they are, and will retain their flavor for a longer period than those produced further south. And that accounts to a great extent for the excellent fruits grown in Salt Lake valley, where they in a measure are surrounded by snow-capped mountains the entire year.

PLANT YOUNG NEBRASKA TREES.

Now, then, if my theory is correct, and I believe it is, the only thing for tree planters to do is to plant none but vigorous, young, and healthy grown trees; and in order to get such patronize those who grow their own stock in Nebraska soil. When you plant your trees give them good attention, and in a few years they will pay well for the money expended and labor performed in taking care of them.

SMALL FRUITS,

such as currants, gooseberries, grapes, raspberries, and strawberries, should not be lost sight of; and a little garden spot set apart for their especial culture will pay the man a large per cent on the amount invested.

BE GUIDED BY NATURE.

After a residence of nearly twenty-three years in Nebraska, I find it a pretty safe plan to cultivate such varieties of fruits and timber as grow indigenous to the country. The wild grape grows in abundance along the river bottoms, and as a result many of the cultivated varieties do well in Nebraska. Just so with the gooseberry, currant, strawberry, plum, cherry—all of these varieties grow in Nebraska and produce good crops, and as a consequence the cultivated varieties do well also, or at least the hardy varieties



LOOKING DOWN THE BIG BLUE (WEST SIDE) FROM CRETE, NEB.

may be planted with assurance of proving successful. Oranges, figs, lemons, etc., are not indigenous to our soil, not even in their wildest state, and neither do the cultivated varieties grow well this far north. The crab-apple grows well at the north, is susceptible of improvement, and by such means of improvement we now grow about one hundred and fifty varieties of apples in Nebraska that have become known all over this country and portions of Europe as the best yet produced.

NEMAHA COUNTY.

Mr. Benton Aldrich reports from Clifton, Nemaha county:

ONE YEAR OLD TREES PREFERRED.

I began planting my apple orchard in the year 1869 with 110 trees; the next year I set out 170 more; the next 900; and in 1874 I put out 55 trees. A part of the trees were three years old from the graft; some were two years old, but seventy-five per cent were one year old when planted, and I much prefer the latter age.

GOOD CULTIVATION MOST PROFITABLE.

Most of the trees were planted on land plowed one foot deep with Mapes' sub-soil plow, a few with ordinary preparation, while a part I planted on land plowed in six-foot wide strips, for the rows, in prairie sod, and the trees were planted the next spring thereafter. This does not pay, the trees not being more than one-half as large as those on the sub-soiled land. I find those on deep plowed land to withstand drouth far better than those on land ordinarily plowed. My best practice in cultivating has been to plow as early in the spring as the ground will permit, and thereafter using a harrow and cultivator often enough to keep weeds down and the land loose until the 15th July. Then let the weeds grow, the more the better. Let me have four inches of soil on top for mulching material. If one begins that way no trouble will come of it. I think a harrow to be the best implement to use in an orchard after spring

plowing. Four years ago I began to manure a few apple trees each year by putting on the surface—not *against the trunks*—in the autumn or winter, one-half of a two-horse wagon load to each tree. Carolina Red June, Keswick Codlin, Duchess of Oldenburg, and Ben. Davis, have been thus treated. These trees have certainly made a larger growth, and no ill effects have been observed.

PEACHES PAYING THREE TIMES OVER.

With pears I have not been successful; but I planted 400 peach trees. They have well paid all expenses three times—twice in fruit and once in fire-wood and stakes, and there are nearly 200 trees left.

DRYING BLACK-CAP RASPBERRIES.

The raising for drying of black-cap raspberries I have found to be a profitable business; the only difficulty being the want of trustworthy help in picking time.

RICHARDSON COUNTY.

Mr. D. Long reports from Falls City, in this county, under date of February 5th:

A GOOD FRUIT COUNTRY.

Four years ago last spring, I set 400 apple trees, which have done remarkably well, though I cannot say that of 300 which I planted two years ago. However, I am not discouraged by an exceptional failure; but when a tree dies, I shall take it out of the ground and plant another in its place, for we have now had experience enough to justify us in believing that we have a good fruit country. Our peaches and grape vines do fully as well as peaches and grapes at Cobden and Villa Ridge, near Cairo, Illinois. I have visited these far-famed fruit-growing localities several times, and I see but little difference between here and there in the growth and bearing qualities of both peaches and grapes.

EXPERIENCE IN FRUIT GROWING—THE BEST APPLES.

Mr. George Gird writes from Middleburg, in the same county, on February 2d:

I consider that we are still experimenting in fruit culture; and the results of our experience vary—some growers meeting the most complete success, while others fail. But I would offer this suggestion: On the rich loam of our prairies, trees are frequently too rapidly developed for fruit buds to be formed; and we, therefore, need carefully to select varieties which will develop fruit even when taking on them a strong growth. To make a practical point, I would say that, according to my observation, the apples best adapted to prairie conditions are the Jeanneting, the Wine Sap, the little Romanite, the June Sweet, the Early Harvest, and the Golden Russet. All these fruit well, and I prefer them in the order in which they are named. Peaches succeed, notwithstanding they are subject to the attacks of a grub which injures many trees; and small fruits also grow well in our county.

SOIL AND CLIMATE TO RAISE THE FINEST FRUITS.

Mr. Gustavus Duerfeldt, of Williamsville, in Richardson county, writes:

There is no question but that we have the soil and climate to raise the finest fruit in size, and of good flavor, as was proved by the apples which Nebraska displayed at the Centennial, and which attracted the attention of every exhibitor. As regards our practical work, however, I have found by experiment, that the high and level prairie—and the poorer of our rich soils the better—is best adapted for the orchard. For instance, the Rhode Island Greening which makes too rank a growth in the low lands, and the wood of which consequently may not ripen well, succeed well on the high lands, and come into bearing three years sooner than on the low lands. I would recommend low trunks for all fruit trees, as these better resist the wind, and the top better shades the tree from the sun.

PAWNEE COUNTY.

Mr. Samuel Barnard, of Table Rock Nursery, Table Rock, Pawnee county, presented his report for this county in person at the meeting, and the horticultural part is as follows:

HOW TO GROW FRUIT ON THE PRAIRIE—A PRACTICAL MAN'S EXPERIENCE.

My report is prepared at the request of Senator Pepoon; but the task is undertaken with diffidence, inasmuch as from nothing less than a general canvass of the county could the report be made perfect, and that I cannot undertake.

LOCATION, SOIL, AND WATER OF PAWNEE COUNTY.

Pawnee county is situated in the second tier of Nebraska counties west from the Missouri river, and is in the south-eastern part of the State, having Kansas on its southern border, and adjacent to the 40th parallel of latitude. The county is eighteen miles from north to south and twenty-five miles from east to west. It has excellent natural water privileges, and where wells have to be resorted to, never-failing water is found at an average depth of less than fifty feet. The surface soil is of good depth, and it is underlaid with a clay subsoil intermixed with sand and gravel—a natural condition which promotes tree growth, and the perfect ripening of the wood and fruit buds.

FIFTY THOUSAND APPLE TREES IN THE COUNTY.

Fruit trees are very largely grown in the county, there being over 50,000 apple trees in orchards, though probably not over 20,000 of age sufficient to bear fruit, the balance having been planted within six or seven years last past. Thousands of trees have died, or were dead when received by the planters—worthless trash, sent out by unreliable dealers as home-grown stock, but which had been shipped from the East and killed by the exposure consequent on transportation, or, at best, being discarded or common varieties. This system has caused considerable money losses, but still more disappointment and discouragement, and the Board of the Horticultural Society ought to protest against it.

BEST SITUATION FOR THE ORCHARD.

Most of the fruiting orchards have been set from eight to fourteen years, the earliest being largely seedlings, some of which have been top-grafted (especially those which have proven of poor quality) and approved varieties have been substituted for them during the season of 1876. A few of our orchards have produced remarkable crops of fine quality, over 31,000 bushels of apples being gathered, besides some from younger trees, which your reporter failed to get note of. Trees of more recent setting promise earlier fruiting than the older planting, probably because of the better selection of soil and location. Under this latter head the avoidance of low land and coves adjoining brooks, where the trees have not light and air, besides being subject to early and late frosts. The old orchards, however, which have been wrongly located—that is wrongly located if the best results are to be obtained, have returned paying crops for the past four or five years.

THE PEACH NOT ONLY A FRUIT, BUT A FUEL TREE.

The peach has not been a perfect success in our county; but that is owing rather to wrong location, yet even where the locality is not good for fruit the peach is regarded as worthy of cultivation, even for fuel and an occasional paying crop. As fuel, the peach yields more wood per acre than almost anything else, as it can be planted closer than other timber, and yet make a good growth; and the wood of the peach is a more useful fuel than the soft wood generally grown in artificial groves. The higher altitudes are better for the peach than the lower ground, for the reason that the luxuriant late growth is not promoted, the wood ripens and endures the winter, and the bloom is not so liable to injury. The peaches also are better flavored, receiving a freer sunshine in the period of ripening.

PLUMS GOOD IN NEBRASKA.

Minor, wild-goose, Lombard and the gages, make up the list of domesticated plums. They have done well, and the perfection obtained by the native plum justifies fruit growers in regarding the plum with considerable favor.

GRAPES WHICH WILL THRIVE.

Small fruits are successful wherever they are given a fair cultivation. Concord grapes have proved an extra investment. The Catawba is much sought after by German growers, and it proves hardy and prolific, free from mildew or rot. Indeed grape vines are remarkably healthy in this locality. In my grounds there are several varieties not yet in bearing, which promise well, and specially worthy of mention, are Martha, Eumalon, Perkins, and Hartford Prolific. The Concord is best for general growth, for like the Wilson Albany Strawberry, it will stand more abuse, and yet flourish better than any other vine.

TREATMENT OF BLACKBERRIES.

The Lawton and Kittatiny blackberries are inclined to winter-kill; but pinching back is a remedy. The past year these varieties furnished me an abundant crop of extra fine berries. I am testing the Snyder which is recommended to me as extra hardy.

Raspberries winter-kill some, but mulching is a partial remedy; and it also keeps the ground moist during the season.

STRAWBERRIES ONE HUNDRED AND SIXTY BUSHELS TO THE ACRE.

When properly cared for strawberries are a grand success, and probably no fruit pays a higher rate of profit. I have a bed of strawberries which has furnished berries enough for family use for the past five years, and some seasons the yield has been at the rate of 160 bushels per acre, worth from \$3 to \$5 per bushel. The experience we have gained, and the facts which we have accumulated, show that fruit will pay, and I have faith in our county; but (though I admit we are making progress) orchardists must still be more earnest and more laborious.

PROGRESS ON THE PRAIRIE.

Over our prairies the dug-out is mouldering; and as it passes away, it gives place to the comfortable cottage. The drones who will do nothing are returning to their kindred East. There is im-

provement every year, and we ought to keep pace by increasing the number of our orchards and farms.

BRIEF CONCLUSIONS AS TO FRUIT CULTURE.

But just to recapitulate a little. In selecting a site for an orchard, the location to be preferred is a northern slope; and that, for the reasons that the ground does not throw off moisture so fast, the trees are less liable to scald, and, consequently, to be infected by borers, and are also less liable to be blown to the north-east by the south-west winds, which exposes their trunks to the direct rays of the sun, and renders them liable to scald. But there is a remedy for this, which is to plant a hill of corn on the south side of each orchard tree, and which will render the tree safe from scald. Wind-breaks should be set upon the south and west. But we also say that close planting is a great error. We frequently see in orchards trees not more than a rod to twenty feet apart, which is entirely too near. Land with us is too cheap to be overseeded, even with fruit trees. Twenty-five to thirty feet square is certainly as close as standard fruit should be placed.

SAUNDERS COUNTY.

Mr. Moses Stocking writes from Wahoo, under date of February 5th:

PRACTICAL SUGGESTIONS AND USEFUL STATISTICS—FRUIT AND FOREST PLANTING ON A LIBERAL SCALE.

According to the returns of the assessors for 1874, it appears that prior to that date, there had been planted 2,017,537 forest, and 52,193 fruit trees, and 56,856 rods of hedge. There being no law requiring the assessors to perform this class of labor, and no blanks for their use, they have since declined to make their blanks and collect the industrial statistics of the county, except in one precinct (Stocking).

We have, therefore, no general data to indicate the extent of

tree-planting in 1874, but from the returns of Mr. J. C. Polsley, assessor of Stocking precinct, we are enabled to approximate the extent of planting in 1875. The county has twenty-one precincts, and multiplying the result in Stocking precinct by 20, will give very nearly the result for the county. Thus:

Fruit trees planted 538x21.....	11,298
Forest trees planted 31,700x21.....	665,700
Rods of hedge planted 360x21.....	7,560

Allowing that the planting of 1874 equals the losses from fires, and those which failed to grow, the total amount would stand thus:

Number of fruit trees planted in county.....	63,491
Number of forest trees planted in county.....	2,683,237
Number of rods of hedge planted in county.....	64,416

The plantings of 1876 were quite extensive, the fruit trees being largely from the Minneapolis nurseries of J. N. Moulton, which were represented in this county by Gilkeson & Winterstein, of Wahoo.

INDIGENOUS FRUITS—PLATTE RIVER BLUFFS SUITABLE FOR FRUIT.

The names, and proportion of varieties planted cannot at this date be determined. But few apples as yet have been grown in the county; here and there a tree has begun to bear; the same remark will apply to the peach and apricot; of pears, I do not know of a tree which has fruit. The wild plum, choke-cherry, mulberry, grape, gooseberry, blackcap raspberry, and strawberry are indigenous to the soil, and grow luxuriantly. The Platte river bluffs, and other high lands of the county appear to be well adapted to fruit-growing; but on the rich valley lands, none but the small fruits seem to flourish.

NUMEROUS ORCHARDS IN SAUNDERS—APPLES, PEACHES, CHERRIES, GRAPES, RASPBERRIES, CURRANTS, AND GOOSEBERRIES.

Mr. Peter Lansing writes from Estima, February 4th:

Between the people and an abundant supply of apples, there is but one obstacle, and that is, time; seeing that a majority of the



VALLEY OF THE BIG BLUE, SOUTH OF SEWARD, NEB.

farmers have put out orchards which are doing well, making the wood, though the trees are not yet old enough to bear fruit. The transcendent crab is a good success; and I have trees 12 feet high, and 11 inches in circumference at five years old. My peach orchard (seedlings) contains 160 trees, three years old in the spring of 1876, healthy, thrifty, and large for their age. In the summer of 1875 there were half a dozen peaches, and in the summer of 1876 half a dozen bushels. The orchard is sheltered on every side. The trees are full of fruit buds, and promise well for 1877. The Morillo, May, and Early Richmond cherries are hardy with us, grow rapidly, and fruit abundantly. The stock bears a high price, however, and I am cultivating the sand and choke cherry from the nursery of dame Nature, and find the former good for drying, no wild fruit being more satisfactory, and the latter useful for jellies. We have no tame plums yet in bearing, but the wild fruit are abundant, and bear bountifully; and some varieties are as good plums as I have seen anywhere. A grove of wild plums planted on high ground are sure to bear every year. Clinton and Concord grapes are a success, the Clinton being as hardy as an oak, and very prolific. I have a five-year old Clinton, which last year produced a bushel of grapes. Concords need protection in winter; and when the season comes I gather mine up in a snug row, and throw on dirt barely to cover them, which, though some work, is sure protection. Of raspberries, I have over two acres all black-caps—the varieties being the Doolittle, the Miawa, and the Native, which are all good. The Miawa has larger canes and berries than the others, and ripens ten days later. My raspberry culture is not entirely satisfactory. A percentage of the canes kill back in winter, but the surviving canes bear abundantly, and the best quality of fruit; and the product pays better than anything else raised on the farm. In currants, I have the Red Dutch, Red and White Grape, Mountain Currant, and Black Naples; and, though I think the soil a little too dry for this plant, all except the Black Naples have done well. Gooseberries do very well; and strawberries also, with proper care, though the latter are not largely planted.

LANCASTER COUNTY.

Professor Culbertson, B. A., of the State University (Chair of Agriculture) reports on February 6th:

STATISTICS OF FRUIT GROWTH IN THE COUNTY.

Before making any statements I desire to say that I have not been able to visit but a small portion of the county in person; and hence some of my statements for the county as a whole are not based on facts from the whole county, but on facts existing in portions visited.

The manner in which the facts were obtained was from the fruit grower, taking down on paper all statements of facts, observations, experiences, and theories as given, including the entire method of treatment. I endeavored to visit those having experience in growing trees in Nebraska, most of whom had had experience in other States as fruit growers; and not a few times was I surprised at the amount of intelligence shown on the subject of horticulture.

There are but few orchards in the county that are old enough to bear; but yet there were several hundred bushels of apples raised in the year 1876. The superior quality of the fruit was encouraging to those who are undertaking the enterprise of planting orchards.

The following is the estimate of the number of trees in the county:

Apple trees.....	25,000
Peach trees.....	10,000
Cherry trees.....	2,000
Plum trees, but few cultivated.	
Apricots, very few.	
Grape vines, grown more or less through the county.	

SOIL FOR FRUIT CULTURE.

There is but little choice to be exercised in the selection of soil, yet care should be had to put the orchard on a site where the soil

will be dry and free from an excess of water any time in the year. If the soil is not naturally drained, it will be a serious detriment to trees. As our subsoil is not so friable as that of the river tier of counties, extra care in deep cultivation before planting would be well repaid.

BEST ASPECT FOR THE ORCHARD.

It is now generally agreed that a northern exposure for the orchard is the best, for the reason that the trees are not likely to be frosted by being too far forward in season of late frosts. Trees do well, however, on all exposures. Other things being equal, it would be very difficult to distinguish between them.

AGE OF TREES TO BE PLANTED.

The universal testimony of those visited is that trees from two to three years from the graft are best for setting. If the trees have been root pruned in the nursery, those three or four years old do well, but when not pruned the young trees have done the best. In planting select those trees that have plenty of living fibrous roots; and be careful about trees brought from a distance. There are plenty of nurseries in the State which have good trees and these ought to be patronized. When the trees are taken up much would be saved by preventing the fibrous roots from becoming dry. From a want of proper care on this point many trees fail after being transplanted.

DISTANCE OF PLANTING.

There is some difference of opinion on this point, but generally the distances between trees and also between rows average about 24 feet. We saw one orchard of 14 years growth, and the limbs were meeting though there were 24-foot spaces between the trees. It would seem that a greater distance apart would be preferable when the trees get old.

DEPTH AND MODE OF PLANTING.

The prevailing practice is from two to three inches deeper than in the nursery. The holes in our subsoil should be deep so that

the tree may have plenty of moist, soft soil in which to start. In planting, fill in among the roots with fine soil; and, if not too wet, tramp well, making the soil come in close contact with the roots. It is strongly recommended in this section of the State to lean the trees hard toward the south-west, so that the tops may shade the body and prevent their being sun-burnt. It is claimed that the trees set in this leaning posture will regain a vertical position in from three to four years.

THE PRUNING OF TREES.

This is a subject upon which there is a great difference of opinion—some holding that no pruning is necessary when trees are first planted, while others believe and practice close pruning, and achieve good results. From what we saw and have practiced, pretty close pruning will secure a much better and thrifty growth, though this depends much on the condition of the roots. The aim should be to produce a balance, making the top correspond with the roots that are *left in the tree in good condition*. After pruning should be attended to while the limbs are small, not waiting until the trees are full of brush of two, three, and four years growth, and then making a general clean out. Such a practice is not attended with the best results. The orchardist who is really interested in his trees, will see when a shoot starts in the wrong place, and nip it in the bud, and thus the tree will lose none of its strength in growing waste wood.

CULTURE OF APPLE TREES.

From what we saw in our travels, we would say, to insure success in tree growth, "Cultivate, cultivate, keep clean!"

We saw trees that had been planted four years in the same orchard, a part had been well cultivated every year, and part had not been. The difference was, that the cultivated trees had made fully six times the growth of the uncultivated, and were models of thrift. The practice of many persons of letting the weeds grow around trees is a bad one, which in many cases proves fatal to the trees; and I think it will be found that the really thrifty orchards are such as have been cultivated. I saw some orchards which were planted in the spring of 1873 (supposed to be a bad

year for tree planting) that had done remarkably well. The trees were two years old when planted—taken right from the nursery—planted well, and had been cultivated and kept clean.

THE CROP FOR THE ORCHARD.

As to the crop to be cultivated in the orchard, nearly all are in favor of some crop that requires considerable cultivation, as corn or potatoes; but oats have been found by a few to be injurious. The culture the first seasons should not be simply sufficient to keep the crop in proper condition, but the trees should have their share. If they cannot be properly reached with the cultivator the hoe must be used, for it is just as essential to the early and speedy growth of the tree to have the soil well pulverized about the roots as it is for corn. It sometimes occurs, after the heavy rains in June, that the soil around the tree becomes baked. This should be attended to promptly, as just after this time is the difficult part of the season to get through.

THE GOOD IN MULCHING.

The practice of mulching trees has been undertaken to some extent. The most successful growers, however, prefer thorough cultivation; but, inasmuch as most persons neglect their trees after harvest begins, mulching would doubtless be an aid to the trees, if properly done, and at the right time. The material to be used is most anything that the farmer has, except bright straw or strong manure. The objection to straw is, that it reflects too much heat, and thereby makes the tree more liable to sun scald. The best time for mulching is a question not fully decided upon; but the prevailing opinion is, just after any good soaking rain in June. If done in the early part of the season, there is danger that the mulching will prevent the rain getting through to the roots of the tree; and thus defeat the object of the operation which is to keep in the moisture.

PROTECTING TREES ON THE SOUTH.

It has been found advantageous to protect the trees on the south side by something that will keep the sun from the body of the tree. For this purpose laths are used, and corn-stalks are good also.

The practice of planting corn close to the tree for protection is considered a doubtful expedient by the best growers, as the moisture taken up by the corn is sufficient to greatly retard the growth of the tree.

PROTECTION BY GROVES.

The custom has been to plant groves in the north and west sides of the orchard, leaving the south and east open, and by some to protect it on all sides. A few are now of the opinion that it is more essential to protect on the south, caring but little whether protected on any other side or not. Most growers prefer at least one or two sides open, from the fact that when the protecting trees get large, too much heat would accumulate, and be too severe on the trees.

GROWTH OF THE PEACH.

Peach trees have done pretty well in most parts of the county, though they are in much the best condition in the eastern portions. The greatest difficulty in peach culture has been from frost. There has been considerable fruit raised within the county. As a general rule, however, the trees are just coming into bearing condition. The trees, by good clean culture, make rapid growth. Some seasons when there are late warm rains, they grow too long, and are much more liable to winter kill. To remedy this to a certain extent, some have found it good to cut off the ends of the limbs, about one-third of the season's growth, so that the wood may ripen. Care should be taken that the pruning is done so late that there will be no tender shoots start out—probably from the middle to the latter part of September would be as well as any, or at the time of some slight frost. One man, an old fruit grower, who had started an orchard in Canada, two in Iowa, and one here, observed that peach trees planted close in rows running north and south, did much the best of any trees that he had observed. The rows, however, should be a considerable distance apart—not less than twenty feet. Another man had observed, where there were two rows of peach trees planted near each other, one row running north and south, exposed to the full force of our west and north winds; the other running east and west, and protected; the result was, the north and south row stood the winters

well, while the other one did not. This is something rather new in peach culture. Viewed in the light of some existing facts, it looks plausible, and is certainly worthy of special trial. Seedling trees are planted mostly.

GRAPE CULTURE.

Grapes have not been as extensively grown in this county as in some others. They have done well, however, when properly cared for; and one man in the city of Lincoln, raised 5,000 pounds one season from a little over an acre of vines. The Concord variety is the main dependence, but the Delaware and Rogers Hybrid are cultivated to some extent. To avoid winter killing, it is recommended to lay the vines down in winter, and cover them up with clean soil or bright straw. It is generally recommended that the vine should be set deep in the ground; that they should receive thorough culture; and that the rows should run in a north and south direction. There are various ways of training. Some train to one stake perpendicular, while others would have stakes from two to three feet apart, and train the vines from one to another at an angle, having the vines all run towards the north. Some, again, prefer posts and wire to train to; and this latter is probably the cheapest method in the end. The methods of pruning are about the same as all books on the subject recommend.

STRAWBERRIES AND OTHER SMALL FRUITS.

Strawberries have been cultivated to some extent; and there are several fine beds in the county. There have been in the past two years considerable quantities of strawberries raised. They are easily grown and cared for; but most people give them but little care. The strawberry, however, requires clean culture to grow large fruit. The beds require mulching in the winter; and a part of the mulching should remain until the strawberries have fruited, to prevent the rains spattering dirt on the berry. The winter mulching should be of old hay or straw. Never manure the bed, for it generally requires some extra labor to fix it so that the wind will not blow it off. Perhaps a good and easy method of keeping the mulch fixed is to spade up some soil on top of the mulching. The Wilson strawberry is the favorite of the county, though a few other varieties are grown.

GOOSEBERRIES AND RASPBERRIES.

The other small fruits have been tried to some extent, but not with very great success. Gooseberries and raspberries promise to do well where properly cultivated, and mulched. As to currants, I did not see any one who had made a real success of them. I think, however, that they can be grown if the directions be followed that have been successful in other places—that of very heavy mulching in June. Blackberries have been grown in a few places with good success. They also require mulching to prevent the berries from drying in the hot sun.

JEFFERSON COUNTY.

Mr. Robert D. Andreson reports from Plymouth, on February 5th:

SMALL FRUIT SATISFACTORY—ORCHARD PLANTING GENERAL—SMALL FRUITS ON THE UPLAND PRAIRIE.

I am the only orchardist and nurseryman in the county who makes a business of growing fruit and fruit trees for use and sale; and so the answer to your circular naturally falls to me. Fruit, and the culture of trees, are receiving more attention than ever before; and there is a lively interest with regard to the small fruits. Almost every resident has planted a few trees, with the usual amount of small fruit for family use; and our experience is, that where there have been intelligent care and culture, a satisfactory degree of success has been achieved. Grapes, gooseberries, raspberries, strawberries, and blackberries do well on our rich upland prairie, though the upright varieties require severe pinching back to prevent a too rapid growth, which (the wood not being ripened) might lead to injury by frost during the winter. Currants have not succeeded well, the plant liking a humid climate which ours is not. On my grounds there are about 400 Concord grapes, three years from the setting, from which I anticipate a fair crop of fruit this season. Of all grape vines the Concord does best for me, and

I am satisfied with it. Our soil is rich and light; and its quality and other natural conditions, induce the rapid growth of fruit trees. When the growth is too rapid, it follows that the wood is not ripened; and there is then danger to the tree from the frosts of winter. The use of ashes qualifies and modifies the soil, and ensures a more permanent and mature growth. Ashes, as experience has shown, are pure gold to the agriculturist. I have also strongly (this, too, is the teaching of experience) to recommend mulching. Mulch, mulch, mulch! in order ever to keep moisture to the trees, and in winter to protect against the frost. A further revision of the fruit list recommended for the State, in view of our extended experience, is an important move in the right direction, and will promote the growth of fruit; but, as at your meeting many practical horticulturists will be present, though we have our favorite varieties suited to our soil and climate, I will not report with regard to them.

SEWARD COUNTY.

On February 3d, Mr. A. J. Waterman wrote from Milford:

FRUIT GROWING ON THE HIGHEST POINTS—PROMISING PROSPECTS—SITUATION FOR WIND BREAKS.

My farm is on one of the highest points in the county; and on that land are apples, Siberian crabs, peaches, cherries, grapes, gooseberries, raspberries, currants, and strawberries, all in bearing, and all enduring the winters well, with proper care. One mile south of Milford, S. R. Douglass has a fine orchard in bearing, and near Milford, Mr. Tift has a peach orchard, in which there are 800 good looking trees, well protected by a wind-break. Several persons in the south-western part of the county have large orchards, and most of them have commenced bearing. Mr. C. C. Jobes has a fine nursery south-west of Seward, and some of his four-year-old trees bore fruit last season. Mr. Jobes is satisfied that fruit will do well in this county if properly handled. Mr. Spear has a nursery east of Seward, the trees in which have made a fine stand and look

thrifty. It is reported from the southern part of the county that fruit culture has there made a good start; and that there are one or two excellent nurseries there, and several fine orchards. In the eastern part of the county there are several small orchards; but they are young, and in that section there is not much fruit in bearing yet. Cherries are raised by nearly all the farmers in the county, and very successfully. The experience we have had shows that the high lands are better for orchards than the low valley lands; and my observations have shown me that the thermometer stands from four to six degrees lower in winter along the river bottoms than it does on the divides. So certainly is it established that the high lands are best for fruit, that Mr. Johnson who had an orchard on the West Blue river, has moved the trees to the table land. Among the numerous apples which thrive with us, I would specially mention the Red Astracan, Early Harvest, Ben Davis, and Jonathan. We have not as yet cultivated much small fruit; and some of our people regard currants as rather hard to raise. With regard to wind breaks around the orchard, I would advise that the heaviest be on the south for apples, and on the north for peaches. In order to have a break which, in effect, will be a good grove, have six to eight rows of cottonwoods, and as many more of maple; and set the cottonwoods on the inside. I have cottonwoods which are eight years from the seed, and which are thirty inches in circumference.

YORK COUNTY.

Mr. L. D. Stilson reports from York, on February 2d:

YORK COUNTY YET NEW, BUT ONE HUNDRED ACRES OF THRIFTY ORCHARD—A GOOD BEGINNING IN A GOOD COUNTY—SMALL FRUITS FLOURISHING.

Of fruit culture we can speak favorably, there being now at least 100 acres in orchard. There are five or six peach orchards which contain from 100 to 350 trees each, besides a few trees in very many gardens which are just getting large enough to bear.

Of course we have but very little fruit, as yet, and for the present have to be satisfied with the promise. The most peaches yet produced by any one man (J. P. Cook) was in 1876, when he had a $\frac{1}{2}$ bushel, a baker's dozen of which he exhibited at our county fair. The fruit was exceedingly fine; and they gave us an inkling of what our trees may be expected to produce when they come into bearing. Cherries and plums grow thriftily; and the trees have fruited in three years from planting. Apples to supply our needs we shall not have so soon, as there were very few trees set until four years ago; and then we bought mostly eastern trees, many of which were worthless when they were put into the ground, and others failed from want of proper care. We have, however, been taught by experience; and the promise is that we shall succeed accordingly. Small fruits flourish, and I never saw raspberries yield more abundantly than they did in my own grounds the past season. Gooseberries also grow like weeds, and yield largely. When I first came to this country, from what I had heard as to "dry climate," I was very much afraid of it, and only set small fruit to make a family garden. After the plants came into bearing, however, the result was so satisfactory that I set two acres of small fruit the past season, and shall double the quantity this season. It is true that strawberries have not done so well as some other fruits; but with more experience and better mulching strawberries may be made to produce well. I now have $\frac{1}{2}$ acre of them, and next year will report. Grapes do nicely if kept free from weeds; and they have been fruited with me two years from setting, and three years from cuttings.

FILLMORE COUNTY.

Under date January 29th, Mr. A. J. Brown writes from Geneva:

FIRST FRUIT IN FILLMORE—108 ACRES PLANTED—A HOMESTEADER'S ORCHARD—DOMESTICATING THE NATIVE WILD FRUIT—PERCENT-AGES OF GROWTH.

My estimates as to the extent of fruit tree planting in the county must be approximate, the data for a full showing not being acces-

sible. We have at least, however, 108 acres of fruit of all kinds, of which about 30 per cent are small fruit; 20 per cent cherries and Siberian crab; 15 per cent seedling peaches and wild plums; and 35 per cent apples—10 per cent of these being seedlings. This is the quantity of fruit trees we have growing; but we have planted more—balance dead—in the years 1872 and 1873 there having been a large quantity of damaged stock sold here, a fact which has since made farmers careful in their purchases. There are several thrifty young orchards in the county, and among the best which has come under my notice is that of Mr. Peter Younger, near Exeter, on the Burlington and Missouri River Railroad in Neb. Mr. Younger has about 600 trees in very fine condition, and expects some fruit next season. He is also experimenting with raspberries, native to our timbered creeks; and he has several thousand plants which appear to embrace over thirty varieties, some of which in flavor of fruit excel the Turner and Doolittle, and all of them are better bearers and are hardier than either of the above named varieties. Of course, we are at the beginning of fruit growing in this county; and we have much to learn, and shall be glad to receive information from others. The settlement of the county is too recent for us to understand all the conditions; and, even where we have not been as successful as we could desire, it may be that we shall do better in the future. My personal experience in fruit planting is as follows: apples, 95 per cent succeeded and grew; Siberian crabs, 100 per cent; cherries, 99 per cent; grapes (varieties, Concord, Clinton, Martha, and Hartford), 97 per cent; currants (Red Dutch, Cherry, and White Dutch), 45 per cent; Black currants, 100 per cent; and raspberries, about 10 per cent. I would add to my imperfect report regarding the fruit growing of Fillmore county, that the first apples here raised were from the trees of Mr. James Barr, who lives near Fairmont. These trees were planted in 1872; and in 1876 Mr. Barr had a half bushel of apples. This is mentioned because the first fruit raised in a new country is worth noting.

CLAY COUNTY.

Mr. John B. Dinsmore reports from Sutton, February 1:

SUBDUE THE LAND BEFORE PLANTING.

The number of orchards in this county is not large, and my observations lead me to the conclusion that those who have begun fruit planting have done so without sufficiently subduing the soil before the trees were set out, and have not attended properly to mulching. The result for the present, therefore, is some disappointment, which we shall get over, though I do not expect there will be much planting this season. We are having peaches and cherries, these fruits now having come into bearing.

FRANKLIN COUNTY.

This county is in the Republican Valley; and is one of those where settlement is recent. Fruit growing has commenced; and Mr. A. M. De Clery reports as follows from Moline, on February 6th:

PREPARING THE SOIL FOR FRUIT PLANTING—EXTENSIVE FOREST PLANTING.

In this county we have not yet had time to get our land thoroughly subdued, therefore we have not planted much fruit, and shall not until the land is ready, when we expect from the general conditions of our soil and climate that we shall achieve success. We have begun forest tree planting, however. One hundred thousand black walnut trees have been put out, and most of them one year from the nut; 150,000 box elder trees; 500,000 cottonwood trees, and 500,000 cottonwood cuttings. The trees are doing well; but the cuttings (which ordinarily thrive as well as young trees), are mostly dead, or rather were dead when they were put out. What hedge planting we have is of cottonwood. Young trees are set about eighteen inches apart to make a live fence.

FURNAS COUNTY.

This also is a Republican Valley county, and the report therefrom, by Mr. N. M. Ayres, is dated Beaver City, January 22d:

FRUIT PLANTING BEGUN.

Our county is quite new, and we have but little to say of any value in the matter of horticulture. We can state, however, that we have all the natural advantages in the matter of soil, climate, and the general lay and conditions of the country to make fruit growing successful, and we expect the best results. It is five years since this and the adjacent counties were first settled, yet we have planted numerous varieties of apples, peaches, and the smaller fruits; and the trees are growing thriftily where the soil is well cultivated. As a rule, however, our experiments in grape culture have not succeeded.

BUFFALO COUNTY.

On February 2d, Mr. S. O. Bassett reported from Gibbon:

ORCHARDS BEGINNING TO APPEAR—ECONOMY OF WIND-BREAKS.

Six years ago this county was almost an unbroken prairie; and we have not, therefore, had the time necessary to plant and develop orchards. In the eastern part of this county, with which I am more particularly acquainted—and to which my report more especially applies—our first plantings have not been successful, owing to the newness of the land. Orchards are beginning to appear, but no apple trees have borne fruit, though those who have protected their trees by wind-breaks, and have properly cared for them, have their later planted trees in healthy condition. We have several small peach orchards which give promise of fruit this season (1877); but that is all we can claim in the way of horticulture.

HALL COUNTY.

Mr. Wm. Stolley reports from Grand Island, February 1st:

UPLANDS BEST FOR ORCHARDS—GRAPES VERY SUCCESSFUL—NATIVE TREES THE BEST—PROTECTION OF FRUIT TREES.

The first fruit trees—apple, Siberian crab, pear, peach, and cherry—in Hall county were planted by me in the spring of 1863. Some of these trees were from Iowa, and some from a nursery at St. Joseph, Missouri. Of this first planting, I have now only eight apples, two crabs, two peaches, and two early Richmond cherries; and, excepting the cherries and the crabs, few are true to name. The cherries fruited in 1867, the peaches in 1871, and apples in 1872; and they have been bearing ever since, and are doing well. After my planting, thousands of trees were planted in different parts of the county. They were bought from traveling Eastern agents, at enormous prices, and most of them are now dead. In the spring of 1875, for the first time, our county obtained a splendid stock of fruit trees—trees raised on Nebraska soil, from the nursery of ex-Governor R. W. Furnas, at Brownville, Nebraska. High and well drained upland seems to be more favorable for the growing of fruit trees than the Platte river bottom, though the fruit thus far raised in our county, has been grown on the most elevated land in the Platte Valley. I consider grape culture to be entitled to more consideration than it has yet received. We have neither a wild apple nor pear, but nature produces the wild grape in abundance—some of the vines bearing a delicious if small fruit, and well fitted to make an excellent quality of wine. In 1864, I planted a small number of Catawba and Concord grape vines, and though I have not protected them during the winters, they have been doing well ever since. The numerous birds, however, have got much of the fruit, while I have had the pleasure of raising it. To prevent the sun scalding of the trunks of young trees, I have placed of late a board to the south-west of those trees which have not top enough to shade themselves. Twice in the season, I subject my fruit trees to a wash of soft soap—first time in the middle of May, and second time the middle of July—and the borer has given me no

trouble. To protect against hares and rabbits, I have begun to cover the stems with tar paper; and I would like to know if this will stop the borer, and also if its remaining on the trees during summer will work any harm to them.

BURT COUNTY.

Mr. E. D. Canfield writes from Decatur on February 2d.

FIFTEEN HUNDRED BEARING APPLE TREES—FAILURES THE RESULT OF
AVOIDABLE CAUSES—SUGGESTIONS FOR FRUIT GROWING—AN
ENCOURAGING FRUIT EXHIBIT.

In making the figures in my report, I am largely indebted to Messrs. R. N. Day & Co., who have an excellent nursery at Tekamah, in this county. They have thoroughly canvassed the county; and are better posted with regard to the condition of its fruit growing interests than most others. The number of apple trees in bearing in the county is probably about 1,500, and apples not in bearing, 2,500. Of the latter a percentage are not in a thrifty condition, and may be considered failures—failures resulting from avoidable causes. Our first orders for trees were given to nurseries at long distances from here; and the trees when they arrived were dried out, frozen or bruised so that they were not fit to put out. This is the first cause for such failures as we have had; and the second is the want of ordinary care on the part of the fruit planter. Many trees are set with less care than a careful man would take in setting a post; and the careless people, when once they get a tree in the ground, give but little more attention either in cultivation or pruning, and leave their trees a free range for their cattle and horses, and to the tender mercies of the elements. Men who thus act need not expect success; but, when success fails to attend them, they bestow their benedictions on the nurseryman. We have not many pear trees planted, yet the fruit is hardy, and will stand a great degree of cold. Plums prove hardy and thrifty, but so far they have fruited but little. Cherries are largely grown, and the kind we can depend on is the Early Richmond, which fact is now generally appreciated, and farmer fruit growers are governing themselves ac-



VIEW NEAR WAVERLY, LANCASTER COUNTY, NEBRASKA.

cordingly. Peaches are raised with tolerable success, and could be more generally, if proper locations for the peach orchards were selected and more care given to cultivation. Small fruits of nearly all kinds can be raised in great quantities, with very little outlay of money and labor, and there is no good reason why every family in the country should not have them in abundance. My table is supplied with fresh fruit from the first of June to October. Speaking generally of fruit culture, let me say that care should be taken to select the most hardy trees; and the list furnished by the State Horticultural Society two years ago is most excellent, though I think it may wisely be extended. There is a gentleman residing near Onawa, in Iowa, considerably north, who succeeded in raising seventy distinct varieties of apples in 1876.* The question of fruit raising in this county is settled beyond doubt; and every year the farmer allows to pass without planting prolongs the time he must do without fruit or buy it at a great expense. After the trees are planted, cultivate for five years as you would for corn. Mulch in winter after the ground is frozen, or before the frost is out in spring, to prevent the trees from blooming too early. Plant peach trees on the north slope, the steeper the better—if the soil be good. Cultivate in early summer, but not after the middle of July, giving the trees time to harden the wood before the cold weather comes on. Let there be no late cultivation of raspberries and blackberries. The exhibits of fruit at our county fair last fall were most gratifying. We had apples, pears, peaches, plums and grapes, which were perfect and beautiful, and which proved our fruit enterprise a complete success.

WASHINGTON COUNTY.

From Blair, on January 29th, Mr. James S. Stewart, writes:

AN ORCHARD OF 700 TREES ON AN EASTERN SLOPE—SMALL FRUITS
SUITABLE TO WASHINGTON.

I am not a professional fruit-grower, though I have an orchard of about 700 trees, which will compare favorably with any of like

* It will have been noticed that at the Centennial Exposition Nebraska exhibited 263 varieties of apples.—R. W. F.

size in the State. My trees came at an early day from New York and Wisconsin; and after they were set out, they were cultivated with plow and hoe for three years as late in the season as the middle of June, with an occasional mulching of coarse manure, and since then nothing more has been done than keeping down the weeds with the scythe. My location is mostly an eastern slope, surrounded by a belt (four rows) of cottonwood timber. In setting, I have been successful; for instance, in the setting of 400 trees, one spring, but six were lost. My plan is to dig a hole sufficiently large to place all roots in their natural position, filling in with the hands pulverized earth until the hole is half full. The earth is then pressed down firmly with the foot; and the hole filled and pressed firmly on the surface. Among my best bearers for summer, Red Astracan and Early Harvest takes the lead; for autumn, the Sweet Bough, Autumn Strawberry, Fallow Sweet, and Nonpareil; for winter, the Jeannetting, Little Romanite, Limber Twig, and Talmon's Sweeting. These varieties all bear annually; the trees are the best bearers, and the fruit good keepers. My pears did well up to 1876, but that year blight appeared. Cherries are manifestly good for our county. The trees are healthy, and bear well. I have Early and Late Richmond, there being about three weeks difference between them in the time of ripening. The following thrive: of grapes, Concord; strawberries, Wilson's Albany; gooseberries, Houghton's Seedling; currants, Red Dutch; raspberries, Doolittle Blackcap.

Mr. John S. Bowen, of Blair, reports under date of January 31st:

FINE APPLES, CRABS, PEARS AND PEACHES.

In comparison with the number of farms opened out in the county, our horticultural work has been but small, yet as a matter of fact, much and good work has been done. In addition to the fine orchards at Fort Calhoun, Bell Creek, Fontenelle, and elsewhere, there are some good bearing orchards in the vicinity of Blair, of which probably that of James S. Stewart is the chief. At the county agricultural fair last fall, fruit growers in this vicinity exhibited fine apples, crabs, pears and peaches. Many farmers within a few years last past, have set out a goodly number

of fruit trees; and the list of sales by one nursery (Moulton's, of Minneapolis) has been published annually for several years, because the sales' list made an imposing show as well for names as amounts. In grape culture, Fort Calhoun excels; but at the late fair a fine display was made from this vicinity, where Mr. Ballard has been successful. Usually in the spring, we have a fine and ample display of strawberries; but otherwise small fruits have not been much cultivated.

Mr. Hiram Craig writes from Fort Calhoun, on February 1st:

PROMISE OF ABUNDANT FRUIT—HAVE LOW-SPREADING TOPS, AND PRUNE LITTLE.

During the past few seasons, there has been a large amount of fruit tree planting in this county, and we have a goodly number of orchards just coming into bearing. If nothing intervenes, therefore, in the course of a few years at most, there must be a large surplus of fruit produced here for the market. We are troubled with the blight among our pear trees; and it is to be hoped that the fruit growers of America will continue to give the matter earnest attention, so as to provide a remedy. With regard to the treatment of orchards, experience leads me to suggest that we grow our orchard trees with low spreading tops, and prune but little, especially on prairie farms. It is also best not to cultivate beyond the first year or two after planting, except to keep down weeds and grass. Root pruning, however, in an old orchard (where the tendency is to a too rapid growth of top) is advisable, in order to produce good crops of fruit.

DOUGLAS COUNTY.

Mr. Geo. McVay reports from Omaha, January 28th:

GOOD ORCHARDS AND HOW TO TREAT THEM—IRON AS TREE "MEDICINE"
—GRAPES AND GOOSEBERRIES A GOOD INVESTMENT.

In response to the notice in the *Omaha Herald*, I will endeavor to contribute my mite of information with regard to the propaga-

tion of fruit in our State. For twenty years I have been an inquirer and an observer in the matter of flower and fruit culture, and for eight years past I have acquired the practical knowledge of experience. I have given my attention mostly to the growth of small fruit, but not exclusively. About eight years ago, upon my ground three miles north of the city, I planted some hundred or more apple trees, mostly dwarfs, and selected of different kinds from the best nurseries in Illinois. The trees have made a rapid and healthy growth, and have far exceeded my expectations. Those now in bearing are the Duchess of Oldenburgh, and the Ben Davis; and I have had fruit from these the past three years. For myself, among the late summer or early fall apples, I prefer the Duchess; and if I was now limited to an orchard of 100 trees, 99 should be that kind. The Ben Davis is a good winter apple, medium sized, and highly flavored, keeps well, and is adapted to a vigorous climate, and it does well in our climate and our soil which—as elsewhere in the State where I am acquainted—is a dark rich loam with clay subsoil. I recommend the following method of treating trees: When the orchard is cleaned in spring, rake the litter into piles. In the month of June, after a saturating rain, with sulphate of iron make a decoction, and pour about half a gallon of the liquid about the roots of each tree. From the mulch pile take sufficient to surface dress ten to twelve inches thick which secures root and surface moisture during the heated term. The operation of the iron is most beneficial. Taken up by the roots, it gives vigor and lustre to the tree, enabling it to retain the fruit instead of casting it, as is frequently the case. I have planted many pears, but with these I have not been so successful, and now the blight—which for years in many parts of the United States has baffled our most skillful fruit growers—is becoming a difficulty. However, determined surgical operations have had a good effect. I unsparingly cut off all diseased wood; and in many cases the remedy has been effectual, new and vigorous shoots being put forth where the pruning shears and saw had done their work. In grapes I have about 500 vines, principally Concords, which variety is well adapted to our soil and climate, and which seems to be the grape for the million. Currants appear to be short lived; and to keep up a supply it seems needful to plant every year. Among gooseberries I name the Houghton Seedling, which is large, matures its wood to its tips;

never winter-kills or mildews; and thrives in this climate and soil. Strawberries are successful here. I grow many varieties; but the Wilson's Albany, and Green Prolific, excel. In going off on the small fruits I had almost forgotten the crab, of which I have about 100 trees, and eight varieties, my favorites being the Hyslop and Transcendent. In peaches I have had but little success, the best being the Old Mixon and seedlings.

BEST APPLES FOR DOUGLAS COUNTY—ORCHARDS YIELDING LIBERAL HARVEST.

Mr. O. A. Wolcott writes from Elkhorn City:

The interest of the people in fruit culture is decidedly on the increase, especially in regard to apple trees, a number of large orchards having been planted here during the past season, while those who were so fortunate as to have orchards in bearing, have reaped a liberal harvest. Near the old town site of Elkhorn City, there are four small orchards, owned respectively, by H. A. Gray, William M. Ryan, O. A. Wolcott, and M. S. Wilcox, which produced last season not less than 600 bushels of apples of as fine a quality as I ever saw. The most prolific varieties are the Transcendent Crab, Talmon's Sweeting, Seek-No-Further, Early June, Fameuse, Winter and Red Astracan, while Early Harvest, Northern Spy, Maiden's Blush, Spitzenberg, and some others, produce much fruit. I regard, however, Talmon's Sweeting as the most prolific; and during the last ten years, my trees of that variety have not failed to bear. It should be added, that nearly all the farms have groves, and on some several acres are devoted to forest tree growing.

DISCUSSION ON FRUIT CULTURE.

MAKE HASTE SLOWLY.

THE PRESIDENT: No doubt the members present will have something to say orally on the general subject of fruit culture in our State; and, at the beginning of our remarks, I would state that one important point for the horticulturist to consider is that, in tree

growing, it is well to prevent the too rapid development of the plant. Our rich soil, the foundation and basis of our wealth, is yet a great difficulty, inasmuch as it promotes a too rapid and rampant growth. A slow growth is healthier than a quick growth; and the slow growth of fruit trees is not an objection, but the contrary.

MR. MADISON, of Nebraska City, Otoe county: Would you not have fruit trees grow rapidly during the fore part of the season?

THE PRESIDENT: I would not care for one season; but I should not prefer it every season.

MR. MADISON: Would you not manure the tree to get that?

THE PRESIDENT: No, I would not.

MELLOW THE SOIL.

MR. MADISON: Does not the soil require what I call sweetening?

THE PRESIDENT: Mellowing: I think our soil is too rich rather than otherwise.

HAVE THE LAND TAMED BEFORE PLANTING THE ORCHARD.

MR. MADISON: There is one point in reference to orchard growing which it is well to set before those who propose to plant an orchard on the prairie. Often, men who settle on a homestead, break land for an orchard, and go on next year to set out trees. Mr. President, is not that almost certain failure?

THE PRESIDENT: I know it is.

MR. MADISON: That is my experience in western Iowa.

A THRIFTY GERMAN'S ORCHARD.

MR. STEPHENS, of the Crete Nurseries, Crete, Saline county: I have a neighbor, a thrifty German, who, in the summer of 1874, obtained 400 acres of land, breaking up that summer a few acres for garden. The next season he broke land for a farm orchard, prepared it, and set out 100 apple, 3 dozen pear, and 50 cherry trees, which have stood two years and made a remarkable growth. In my own experience, I prepared in the spring of 1873, 13 acres of land which had been broken the previous season, and not stirred in the fall, spending \$14 per acre in preparing the ground. I planted

1,100 trees, out of which only five died that season; and, where the trees were mulched, they made a growth of about two feet, and where they were not mulched of about twelve inches.

AN IOWA NURSERYMAN'S ORCHARD IN FRANKLIN COUNTY.

MR. BUDLONG, of Amazon, Franklin county (who has had a large experience as a nurseryman in Iowa): I have had experience in fruit culture five years on the farm where I now reside. I thoroughly broke the land where I planted my fruit, going over it again and harrowing it thoroughly, with six horses. In the spring I planted 700 cherry, 500 pear, 100 plum trees, and other fruits in proportion; and during the winter one-third of them died. The next season I mulched pretty well; and the trees went through the winter successfully.

THE ORCHARDS OF LANCASTER COUNTY.

MR. ROBERTS, of Lincoln: I do not consider myself competent to report on the horticultural condition of Lancaster county; but that work has been well done by Professor Culbertson. However, I will say that in traveling about the county I see much to encourage; and also facts which are worthy of record. I may say that in the southern part of the county, especially in the neighborhood of Centreville, where there are some old settlements of Germans, I find that they have successfully planted a goodly number of trees, and some of them have good bearing orchards; but, in this part of the county, we have not as yet many apple trees in-bearing, though we have a considerable number of thrifty orchards.

GRAPES IN SEWARD COUNTY.

MR. E. M. SPEAR, of Seward, Seward county: Mr. Lampson, of our county is one of the first among us in obtaining fruit. I do not know how many grape vines he has; but last season he had quite a quantity of Concord grapes which he was selling at 7c per pound. There is a large number of promising apple and peach trees planted and thrifty; but cherries seem to do the best with us.

FRUIT STATISTICS OF SALINE COUNTY.

MR. STEPHENS: We have already raised and harvested a little fruit in Saline county, there being at least four orchards there in bearing. These orchards are those of Mr. Lewis Cox, near De Witt, Mr. John Wahl, on Swan Creek, (which was planted in 1864), Mr. Ruble, near Pleasant Hill, and Mr. Tobias Castor, near Wilbur. I made an attempt to get at the number of fruit and forest trees set out in the county, from the county records at Pleasant Hill; but I found that the assessor had failed to make returns. Of course there must be some returns, because all farmers know they are entitled to a release on tax for tree planting;* and it seems to me most desirable to have some provision by which the assessors will be compelled to make returns of the number of fruit and forest trees planted in the county. There are no vineyards in bearing; but there are many promising vineyards in the county, and there are also many grape vines about Crete which are bearing handsomely. As regards the orchards—and many farmers have orchards containing 500 to 600 trees—notwithstanding the bad season of 1874, the trees are doing well now; and the decided feeling is that we can succeed in growing abundant fruit, and there is a growing interest in tree planting, though we feel that we need to take more care in preparing the ground and in planting our fruit trees than was practiced when we first commenced our horticultural work in Saline county. For instance, experience has taught me that in planting a tree it must be given a decided lean a little west of south. If it is planted upright in the ground the strong south-westerly winds cause the trunk to lean over, exposing it to the hottest rays of the sun, thus inducing sun-scald and consequent liability to the attacks of the borer. The trees, however, if they lean as I recommend, are shaded by their heads so that sun-scald is prevented; and the borers do not affect them so much.

* The law of Nebraska exempts from taxation of the property of each tax-payer who shall, within the State, plant and suitably cultivate one or more acres of forest trees for timber, the sum of \$100 annually for five years, for each acre so planted and cultivated; and the sum of \$50 annually for five years, for each acre of fruit trees so planted and cultivated.—R. W. F.

OTHER METHODS OF PROTECTING TREES FROM SUN-SCALD.

MR. MADISON: I like the idea of planting a hill of corn to shade the trees.

PROFESSOR THOMPSON: I have read that sun-scald is prevented by a wrapping of tarred paper.

THE PRESIDENT: No doubt; but I think it will be injurious if kept on at all seasons. It will make the bark tender.

PROFESSOR THOMPSON: It looks so to me.

MR. BARNARD: Experience shows that planting a hill of corn, as recommended by Mr. Madison, is a most successful method of protection; and, though the success attending the use of tar paper in protecting the boles has been questioned, I consider that, with proper management, it is a perfect safeguard against rabbits and moths.

MR. MADISON: How wide would you have this paper?

MR. BARNARD: Twelve inches, for protection against rabbits; but I think it is not safe in the summer season, unless the paper is perforated.

MR. STEPHENS OBJECTS TO PLANTING CORN FOR PROTECTING TREES.

MR. STEPHENS: I think that the planting of corn to shade fruit, in certain seasons, and on the prairie, is liable to take too much moisture from the soil; and, if trees are wrapped, let it be with old rags, or hay or straw bands. I consider, however, that the plan of leaning the trees is the most effectual remedy. Mr. Wahl, on Swan creek, planted his orchard on the lowest bottom on the north side of the creek, where he had the protection of timber and of a high bluff; and I think he was pretty well protected on the south side also. The trees were planted upright; and now, after the lapse of twelve years, though the trees are in bearing, yet they lean to the north, and, in consequence, the exposed bark is peeling off. By leaning the tree when planted to the south-west the top shades that side which needs protection, and the tree will straighten itself in the course of a few years. When they are planted straight in the ground the top grows most on the north side, for the reason that on the exposed south side the sap seems to be soured, and does not circulate so freely.

MR. O. PARKER, of Lincoln: That is my experience.

THE PRESIDENT: I have noticed that, as a rule, our trees bear most profusely on the north side, a fact which shows a better circulation of sap on the north side.

HOW TO PLANT A NEBRASKA ORCHARD—ONE NURSERYMAN'S METHOD.

MR. STEPHENS: I have more than 5,000 trees in orchard; and I am experimenting with 170 varieties of apples, but do not recommend over 20 varieties to the non-professional growers. I prefer for the orchard high rolling ground, the northerly slope being better than the southerly. In planting, let the ground be laid off in lands 20 feet wide, running with the slope if it be not too abrupt. Plow to dead furrows, trenching or subsoiling by using two teams in the same furrow. Plow backward and forward in dead furrows until the ground is loosened 18 to 20 inches in depth—this work being best done, in the fall. If the trees are not planted till spring, let the ground mellow with frost and then back-furrow into the dead-furrows until ridges are raised above them, dragging thoroughly after each plowing. Plant on these ridges over the original dead-furrows—for this gives drainage, if the season is too wet, and greatest depth attainable, so as to secure moisture, if the season is dry. I also recommend mulching as important, the trees having double the thrift when mulched, as compared with those that are not mulched; and I calculate to lean my trees hard west of south. Following this system I obtain the best results. I would not cultivate after the middle of July; but mulch in the latter part of summer, and allow it to remain during the winter—a great object being to check too late a growth; and also too early a start in the following year. The tree should not be trimmed the first year; but gradually trimmed in after years. Two-year old trees I found to be the best; and because there is more leisure for the work fall planting is to be preferred; but, if the planting is done in spring, let it be as early as possible.

ANOTHER NURSERYMAN'S METHOD.

MR. BARNARD: I agree generally with Mr. Stephens, with some exceptions. In planting an orchard this is the method which I follow, and which I recommend: I stake out the rows and com-

mence plowing, throwing the sod each way from where the row is to be placed, working the ground as deep as possible, and following in the dead-furrow with the deep tiller to a depth of 16 to 20 inches below the level. I then change back to the stirring plow, and back-set into the dead-furrow with two furrows from each side of the centre. I then place a stake where each tree is to be set, when the holes can be readily made with a shovel. I set the trees a little deeper than in the nursery, and use the top sod for filling round the roots. I consider the tree should stand erect as in Nature's order; and I plant it accordingly, tramping the ground about the roots firm. After filling the holes within about two inches of the level, I throw in about two or three inches of mulching of coarse straw or hay, and cover with about two inches of soil to keep the mulch in its place, to hold the moisture, to prevent the harboring of vermin, and to avoid having bright straw on the top which reflects the sun's rays, and which renders sun-scald possible. Bright straw used is a danger to the trees.

SITUATION OF THE ORCHARD.

ELDER YOUNG, of Lincoln: I have 40 acres of land desirable for an orchard, but it has a southern slope, and I am told that is dangerous for the orchard.

THE PRESIDENT: The general impression in this State is that the north or north-western slope is best; and that because the trees are kept back later in the spring, and the wood ripens earlier in the fall. This prevents the trees from making too early and too late a growth; and they are not injured by the winter. They are thrifty and produce the largest crops. Still, there are very many successful orchards on a southern slope. In my own grounds I have slopes to every point of the compass; and I cannot see in the trees any perceptible difference.

MR. J. W. MESERVE, of Beatrice: The ground thaws too early on the slopes facing south, and vegetation starts too soon.

THE PRESIDENT: At Brownville the valleys from the river run east to west through the bluffs. Fruit trees are planted on the north and south exposures; and it is found that those to the north do best.

MR. STEPHENS: But let it be understood, that fruit can be grown

on a slope facing south. If orchardists will keep the trees back in the spring, they will raise plenty of fruit on such a slope.

AN ORCHARD AND VINEYARD ON A HOG BACK.

MR. JAMES MOORE, of Nebraska City, Otoe county: In the earlier days of our settlement, Mr. Clayton, an Englishman, came among us from Australia, by way of California. He was searching for a place where he could locate a home, and grow fruit. I showed him what we thought the best lands in the neighborhood of Nebraska City; but he selected a location on the top of a hog back—the poorest looking land, and such as none of us would touch. There he planted his vineyard, and his orchard, and there he has been most successful.

SOIL FOR THE ORCHARD—A GEOLOGICAL SURVEY RECOMMENDED.

One topic for discussion was the kind of soil suited to the orchard; and when this came up, Professor Wilbur, of Illinois, and Wilbur, Saline county, Nebraska, said: There is much mystery in vegetable life, as in all kinds of life. Though most writers are united in considering that a tree derives considerable nourishment from the atmosphere, yet, of course, much comes from the soil, and soil therefore is a matter of importance in horticulture. Considering this fact, and remembering that in this new State we have not yet been able to study and know its resources in this respect, it is important that we should have a thorough geological survey of the State; and therefore it might be proper for this Association to recommend to the Legislature the measure now before that body for a geological survey, which will instruct us thoroughly as to our resources, and enable us most rapidly to develop the great riches of the State.

MR. PRESIDENT: The subject of a geological survey of the State we propose to bring up.

THREE KINDS OF SOIL IN ONE ORCHARD.

PROFESSOR THOMPSON, State Superintendent of Education, and formerly head of the State Agricultural College: On the piece of ground planted to orchard on the college grounds, there are three

kinds of soil. One is a decidedly sandy loam with an adhesive clay subsoil; another lower down the slope is what I would call a pretty stiff clay for this country—the ordinary prairie soil with a deep, stiff clay subsoil, almost impervious to water; and another still lower down the slope, consisting of the ordinary bottom soil. To my surprise, I have not found much difference in the growth of trees in these different soils—either forest or fruit trees; and it may be that there is not as much in soil as we sometimes think.

“GUMBO” GOOD FOR PEARS.

MR. BARNARD: My experience shows that a soil which is conducive to the growth of the apple is not equally favorable to the pear. I have stated in my report the situation I would choose for an orchard; but I have on my land a piece of gumbo—soil which cannot be spaded over seven inches deep, and which is equally unworkable whether the weather be too wet or too dry. I had bought a number of pear trees as prairie grown; but I found that they had never been grown on the prairie—prairie-grown trees having low limbs, while those grown in a timbered country are inclined to push upward—and were not fit for my market. I told the men to plant them anywhere, and they put them in this gumbo, and east, west, north or south, I never saw trees grow so luxuriantly as these. It is five years ago this spring since these trees were planted. They have grown six feet per year, but I have kept them back. One of my neighbors has a pear orchard on this kind of soil, but with more sand in it than mine, which has made a perfect success. The orchard has been planted seven years, and last year he averaged \$3 per tree, and the pears were very fine.

MR. STEPHENS: What is the slope?

MR. BARNARD: South-east. A light clay soil seems more congenial to them than the black. They do not make quite the growth, but the wood is healthier.

GOOD HIGH PRAIRIE LAND PREFERRED FOR THE ORCHARD.

MR. STEPHENS: I notice in Saline county that apple trees grow better on the high prairie land than they do on the lands next the draws, and I prefer good, high prairie land to the richer land in the bottoms, which grows the best corn. On the recommendation

of the President, I bought my place with a good deal of north slope to it, and with the soil not too rich, and I find that the best.

MR. JENKS: My nursery is all on high land, and consequently it does well.

SOIL OF THE NEBRASKA MID-WESTERN COUNTIES.

PROFESSOR WILLIAMS, of Kenesaw, Adams County: While we are upon this subject of soil, I would say that our mid-western counties, and down into the Republican Valley, are almost exactly identical with that of your river counties, where you have succeeded well with fruit.

MR. BARNARD: The soil of the Nemaha Valley is the same as that of the Missouri bluffs.

WHEN TO TRANSPLANT TREES FROM THE NURSERY TO THE ORCHARD.

MR. JENKS: We have not brought up the subject of the age when trees should be transplanted; and on this point I would say, that, when planting an orchard, I would myself take two-year-old trees every time; but I find that my friends to whom I recommend trees do best with the four-year-old trees.

THE PRESIDENT: In the spring of 1867, I planted 100 three-year-old trees grown in Nebraska City, and I did not lose one in the 100; but the next spring I planted beside them 100 one-year-old trees, and now the latter are the largest and thriftiest. I prefer, however, a two-year-old tree, though it is care and attention which ensures success. If the trees are two, four, or ten years old, if I am allowed to take them up and re-plant them, I don't care about the age. The question, however, is what is the most practical for the general mass of planters; and here, I think, that the two-year-old trees most people can handle best.

MR. JAMES MOORE: Would you not take up 500 or 600 trees, and carry them 100 or 150 miles, and guarantee 90 per cent of them?

THE PRESIDENT: I would, more than that.

HAVE ROOT ENOUGH.

PROFESSOR THOMPSON: In transplanting trees into the orchard, while we get enough top to make them live, we should see that we have sufficient root to make them vigorous.

PLACE FOR THE PEACH ORCHARD.

MR. STEPHENS: I know a peach orchard in the south-west part of Lancaster county, which is remarkably successful, there not being a single defective tree. For the first two seasons, the trees were covered; but otherwise they had but little protection. In traveling about the country, I find that the peach does best on the high prairie.

PROFESSOR CULBERTSON: I have not examined the south-western part of the county; but in the south-eastern the peach trees appear to be healthier than west of north—a fact which I attribute to some difference in the subsoil. We have some trees on the agricultural farm, which last summer started from the ground. We cut them down to the ground, and they grew up vigorously. In September we cut off six or eight inches from the ends of the limbs, and I don't think the winter injured them in the least.

HOW TO GROW CURRANTS.

PROFESSOR THOMPSON: I would be glad to hear the experience of gentlemen with regard to the kind of soil best to raise currants in.

MR. J. W. MESERVE: Five years ago I came to this country, bringing with me apples, peaches, grape-vines, currant bushes, gooseberries, blackberries, and strawberries. I found everything to do well, except the grapes and the red and white currants, though planted on the newly-broken prairie. The blackberries seemed as if they would take the whole ground, and last year I had a large crop of Kittatinnies. The red and white currants, however, did not thrive, nor the grapes—Concords and Isabellas—and having given them good cultivation, it seemed at the end of three years as if I had been beaten. But a year ago last winter, I determined to mulch them deeply with old prairie hay, and to cease cultivation, allowing the mulching to stay. That operation has been most successful, both with the grapes and the currants.

MR. BUDLONG: The land I have prepared for orchard nearly lies in the second bottom of the Little Blue river, and only about fifteen feet above the bottom. It is about forty rods by eighty long, and has slopes to the south, east, and north. From the high ground there has been a wash of clayey soil down the slope; and it forms a low ridge just where the slope joins the bottom land. I first planted my white and red currants—Red and White Dutch, Red Cherry, White Grape, and Versailles—in rows up the slope north and south. They did not succeed, except (as I noticed) where the bushes crossed the ridge. I therefore changed the base of operations, and ran the bushes east and west on the ridge. There they have succeeded; and the first year they gave me a good crop of fruit. The Red Cherry has not done so well as the others; but the Versailles is remarkably successful.

ORCHARDS MAY FAIL—GET NATIVE TREES.

MR. WINSLOW, of Mount Pleasant, Cass county: I have one orchard which I have planted and cultivated carefully on good ground, but it has not been thrifty. A considerable number of the trees have died, and the rest have only kept alive, and that is all. Can some of you gentlemen tell the cause? for I know orchards where the trees have been set in holes dug in the sod, and the weeds allowed to grow, and yet which have succeeded.

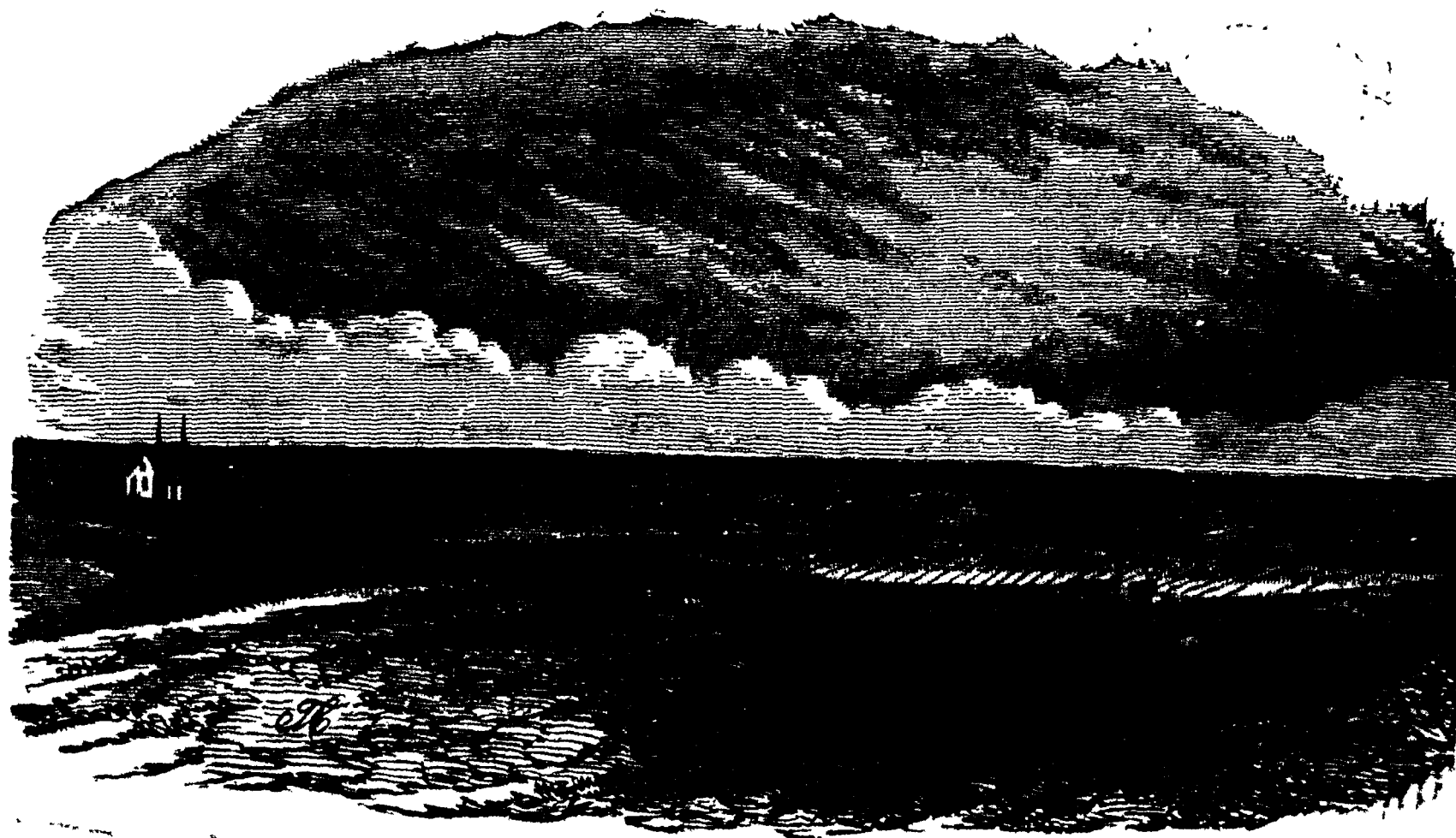
THE PRESIDENT: Where did you get your trees from?

MR. WINSLOW: From Illinois; and I have been successful with trees from Nebraska city.

MR. BARNARD: If you will remember the winter before you got your trees was hard in Illinois, and there was but little of their stock that was not injured. If you had broken one of these off, you would probably have found the heart of it dead.

MR. PRESIDENT: Under the circumstances you state, I have no doubt but that your unthrifty trees were unhealthy when they were set out.

MR. STEPHENS: The summer of 1872 was quite dry in portions of Illinois, and it was followed by the hard winter of 1872-3, and quite a proportion of trees in Illinois were injured by that winter.



PRAIRIE, CORN-FIELD AND CATTLE, SIX MILES WEST OF LINCOLN, NEB.

FRUIT INTERESTS IN SAUNDERS COUNTY—FAILURES RESULTING FROM
BAD TREES.

MR. JENKS, Ashland, Saunders county: I would corroborate the report made by Mr. Lansing, from Saunders county, his experience also being mine so far as we have gone. In our part of the county many trees have been sold to the farmers, and many have died. About four or five years ago there were about eight car loads of fruit trees sold at Ashland; and, out of that number, I do not think there are more than 500 alive at this day. I would not throw all the blame of the mortality on the agent who sold the trees. It was a bad season, and the farmers who planted them did not take proper care; but at the same time many of the trees were dead when they arrived at Ashland, and many others were in such bad condition that they died the first season. But, to speak of the present condition of the fruit interests in our county. We are at the beginning of the enterprise; but yet, we have in our part of the county—of which I more particularly speak—got some orchards in bearing. During the past three years a great many western grown apple trees have been sold and they are doing well; and as a matter of fact—though pears have not been a success—apples and cherries have been most successful? In small fruits we have nothing to boast in reference to blackberries and currants; but raspberries and strawberries are successful.

MR. BARNARD: Where were the eight car loads of trees of which you have spoken, grown?

MR. JENKS: They were sold as West Point trees not over two years old; but I do not suppose they were grown there. The trees were large and old with scarcely any root; and they came probably from Illinois. I saw the trees, and saw that they were in bad condition. They were mostly dead; and, of those that were living, many had the bark shriveled up, and the limbs mostly dead, and but very few of that consignment of trees are now living.

AN EXPERIENCED FRUIT-GROWER RECOMMENDS NATIVE STOCK.

MR. J. MESERVE related at length his experience as a fruit-grower in southern Illinois (opposite St. Louis) and at South Bend, Indiana. It was exceedingly interesting, and clinched the conclu-

sions reached in Nebraska, that, for fruit to be successful, it must be acclimated, and that fruit trees which have been raised in one latitude and one kind of soil cannot be transplanted to another with assurance of success.

A SHARP FAR EAST TREE PEDDLER.

PROFESSOR AUGHEY: Before coming to Nebraska I used to be much in a great nursery in Westchester county, Pennsylvania; and I found that a man would come there and buy all the rejected stock at low prices. These he would bundle together; give to the separate bundles any name he thought proper; and then sell them under these fictitious names in the western counties, representing himself as the agent of a respectable house in New York.

THE SOCIETY RECOMMENDS NATIVE TREES.

Taking all the circumstances into consideration—climatic considerations and the peculiar quality of Nebraska soil—at the end of the discussion, on the motion of Professor Williams, seconded by Mr. James Moore, it was unanimously

Resolved, That the Society emphatically recommends Nebraska fruit planters to purchase Nebraska grown stock, they being most likely thus to get the best acclimated trees; most certainly true to name; and most likely to grow successfully.

NEBRASKA FRUIT AT THE CENTENNIAL—THE METHOD OF SHIPPING.

MR. P. L. WISE, PLATTSMOUTH: I had last August the task of gathering fruit in Cass county, and taking the same to the Centennial exhibition. I arrived at Philadelphia on September 8th, with eight barrels of fruit, and placed the same in Pomological Hall. I was there a week, during which time other States placed their exhibits; and from those who came there we had the satisfaction of being congratulated on every side, because of our pre-eminently good display—a display which sustained the reputation the State had achieved at the National Pomological Exhibitions at Richmond, Boston, and Chicago, and I understand the State has received awards for apples and pears.

MR. BARNARD: What was the method adopted in packing and shipping.

MR. WISE: I took every apple separately wrapping it in paper, and lined the barrels all around with two or three thicknesses of manilla paper; and our apples were shipped as perfectly as they could be carried a dozen rods in a basket. A Philadelphia firm which has shipped apples to England for eighteen years adopts this plan; and their fruit is put upon the market in good shape.

MR. STEPHENS: The horticulture of the State was represented at the Centennial at small cost.

THE PRESIDENT: Yes; that fact is demonstrated by the Secretary's report. We did a good work at a very small expense.

LIVE HEDGE PLANTING IN NEBRASKA.

The following are the portions of the various reports referring to hedge planting:

PAWNEE COUNTY.

Mr. Barnard reports his

EXPERIENCE IN HEDGE PLANTING—HEDGING CHEAPER THAN FENCING—HOW TO PLANT AN OSAGE HEDGE.

Not far from 400 miles of Osage orange hedge is planted in Pawnee county, much of which is a good fence, though neglect in some cases has made the hedge a failure. Experience and observation have shown me, that four years is ordinarily all the time that is required to rear an Osage hedge that will defy stock, and at a less expense than posts alone could be furnished. In proof, take the figures. To fence a quarter section on the boundary lines (two miles) four acres of land must be plowed twice, at a cost of \$1.50 per acre, equal to \$12.00; 140,000 plants, \$21.00; and planting, at 50 cents per 1,000, \$7.00, makes a total cost of \$40.00 for two miles of hedge when set, or but little more than 6 cents per rod, which is cheap enough. The after culture need be but little more

than good husbandry for corn, with the exception of pruning, which can be done at a less expense than the same amount of corn land can be cleared of the corn crop. But let me say how, in my judgment and according to my experience, an Osage hedge should be set. In the first place, the hedge row should never be broken so as to leave the back furrows where the row of hedge is to be planted. On the contrary, a land not less than one rod wide should be laid off, making a dead furrow where the hedge is to be set, and the second plowing should be done in the same way, deepening the dead furrow. Then backset into that dead furrow, and you have a deep tilled bed (and not ridged), wherein to set the plants. Cultivate as near level as possible, and never allow ridges along the hedge row, and the better cultivated and wider the hedge row, and the less danger from gophers. In the after cultivation keep the ground loose and clean; but never cultivate with the plow after the middle of July, as this will promote too late a growth, and when winter comes the wood may not be ripe.

RICHARDSON COUNTY.

Mr. Long reports that

OSAGE ORANGE IS A GOOD HEDGE.

In this county my observation is, that Osage orange makes an exceedingly good hedge. During the past four years there has been a large amount of this kind of hedge set out; and, as a matter of experience, they make the best and cheapest fence of anything of which I have any knowledge.

Mr. Gird writes of the

GOOD FENCES IN RICHARDSON.

Hedging has been carried forward to a considerable extent, and there are probably more good fences in this county than any other in the State.

JEFFERSON COUNTY.

Mr. Andreson prefers the

GRAY WILLOW FOR HEDGING.

We have not succeeded with the Osage; but the gray willow cannot be spoken of too highly for groves, wind-breaks, and hedges, being hardy, of quick growth, and ornamental withal.

SAUNDERS COUNTY.

Mr. Lansing says that

PROPER CARE WILL PRODUCE A GOOD HEDGE.

Though there have been failures in Osage hedges, yet there are a number of good Osage hedges in the county, which show that, with proper care, this plant can be made a success in hedge planting. Some farmers are trying the honey locust, which seems to do well; and others, the box elder, which is hardy, which will bear crowding, which produces a stiff brush, and which would support wires at five years old.

SEWARD COUNTY.

Mr. Waterman looks on the

OSAGE AND LOCUST AS SUCCESSFUL.

The Osage hedge can be raised just as well here as in Iowa, and with me its success is proven beyond a doubt. Many farmers, however, are trying the Locust, which is said to be doing well. In raising a hedge, the chief enemy to be overcome is the gopher.

YORK COUNTY.

Mr. Stilson says that

FARMERS PROPOSE HEDGING.

We have not much hedge planting in York county. My own observation does not embrace more than five miles of what would be called hedge in York; but many are thinking of setting this spring. - Of the hedge set, the greater part is not in good condition; but this is owing to poor plants, poorer setting, and still poorer culture—evils which can all be obviated by proper care and attention.

FILLMORE COUNTY.

Mr. Brown reports more than

ONE HUNDRED AND TWENTY-FIVE MILES OF HEDGING.

We have planted in the county 75 miles of Osage hedge, 32 miles of willow, and 20 of honey locust; but ignorance of the best methods of cultivation (and probably also the fact that the soil is new and not perfectly subdued) renders the success achieved with the Osage less than we could desire. The best Osage hedge I know, and one which will make a fine fence, is on the land of Mr. H. R. Demming. Sherman & Rogers (I think that is the name of the firm), of Lyons, Iowa, have contracted to plant a number of miles of Osage hedge. They plant the seed where the hedge is to grow, giving it as their reason that the tap root of the Osage should never be cut.

FURNAS COUNTY.

Mr. Ayres reports the

HONEY LOCUST

as being the hedge plant for this county.

HALL COUNTY.

Mr. Stolley considers experience

FOR THE HONEY LOCUST AND AGAINST THE OSAGE ORANGE, AND
COMMENDS THE WILLOW.

Two hundred rods of hedge composed of white or gray willow were set out in 1873; and since then this plant has been set out extensively for hedges, and with success. There are many hedges also of honey locust and Osage orange, the experience of our farmers being in favor of the former and against the latter, the locusts succeeding wherever they are protected during the first winter after setting out. Still I believe that the native black willow will make for us the best hedge plant; and that with both the black willow and the white willow, good and efficient hedges can be made.

BURT COUNTY.

Mr. Canfield favors the

HONEY LOCUST FOR HEDGE, AND COMMENDS WILLOW AND SOFT MAPLE.

In hedging Osage orange has not proved a success with us; and we have had much better results from the willow and soft maple. The favorite hedge plant so far, however, is the honey locust, which we believe will give us the most perfect hedge.

WASHINGTON COUNTY.

Mr. Hiram Craig favors

WHITE WILLOW FOR HEDGING.

In the matter of hedging and wind-breaks there is nothing better than the European white willow. It makes a rapid growth, is easily cultivated, and is valuable for fuel and poles.

OPEN TALK ON HEDGES.

REASONS AGAINST RIDGING.

MR. STEPHENS: I would like to ask Mr. Barnard his objection to ridging, either before or after cultivation. (See Mr. Barnard's report.)

MR. BARNARD: The reason is threefold. When plants are ridged the wind blows the dirt from them; the water washes the soil from the roots; and in the winter the frost is more apt to throw the plants to the ground. I plant, therefore, on the level.

MR. MADISON: Would you set the hedge one row or two rows? I believe there is not any system, though the hedge with two rows is harder to cultivate.

MR. BARNARD: There is no difficulty in stepping over three rows. I would set the plants behind the spade, and eight inches apart. I plant about 8,000 to the mile.

PREPARING GROUND FOR HEDGE-ROW.

MR. MADISON: Have you tried putting plants in with the plow?

MR. BARNARD: I have, but not to any great extent. Where the plow is used, some tip off on one side, and some on the other. In planting a hedge-row, in the first place, I throw the furrow outwards, leaving the dead furrow as deep as possible, and then back-set on the dead furrow, thus preparing a deep bed for the plants, breaking a rod at least from the hedge row each way. For the second plowing I turn the furrow outwards, making a deep dead

furrow, where the plants are deep set, and then back-set into the dead furrow. The line where the hedge-row is to be, being marked by a line, a man spades openings for the plants. A boy places them in, pushing them back to the spade; and, when the spade is withdrawn, the earth is pushed up to the plants by the feet in walking along.

MR. STEPHENS' METHOD: HE PREFERS A RIDGE.

MR. STEPHENS: When planting a hedge-row, I break the row a rod in width; and so that the dead furrow will be where the hedge is to stand. The ground is plowed in the same way into the dead furrow, making it as deep as possible—16 to 18 inches if possible. Then I drag fine, and back furrow into the dead furrow, so that when completed the ground is ridged a little where the plants are to be set. I now split the ridge with a deep furrow, and stand the plants to the left side, and tramp the dirt to the roots from the furrow enough to hold them in position. I then plow the furrows back over them, and drag and roll. When completed all the plants will be covered a little (and if covered entirely it is no objection) thus being preserved from drying up while the roots are striking, and when growth commences it is rapid. Mr. Williams, of Glenwood, Iowa, who has had twenty years' experience, adopted this plan after planting thirty miles of hedge behind the spade.

SET BEHIND THE SPADE.

MR. BUDLONG: I have had considerable experience in hedge planting, and I set behind the spade, the method of W. H. Mann, the hedge-king of America. I have always had success with this process.

MR. MADISON: What method of culture do you follow the first year?

MR. BARNARD: The first year I let them grow; but I cut back hard in the spring or late in the fall. Some prefer the fall, but there is not anything in particular gained in the fall. In cultivating, I take an ordinary stirring plow, and straddle the row with the horses. I throw a furrow on each side, and then work it back, keeping the earth up to the plants; but I do not ridge it much.

CUT BACK, AND MAKE LATERAL BRANCHES.

MR. MADISON: Twenty-five years ago, I commenced hedge-planting in Illinois, setting in rows eight to ten inches apart. The first year I kept weeds down, and after the plant had made a little growth I cut it back, throwing the sap into the lateral branches, thus thickening the hedge, for I would have my hedge so that a chipping bird cannot make its way through. In September, I cut the tops, so that the plant will mature, and there will be no winter killing. It is lost time to allow the plants to grow up. Near Brownville, I once saw one of the finest of hedges, which had grown up in that way. At the time, a man was cutting it close to the ground, and he was injuring that hedge. Mr. J. L. Smith, of Tabor, wanted to enclose, and he asked my process. I informed him, he adopted it, and you cannot find in western Iowa a better hedge than he has to-day.

OSAGE ORANGE AND HONEY LOCUST.

MR. STEPHENS: On one side of my farm I have Honey Locust, and on the other side Osage Orange. With the same amount of trimming the Osage makes the thickest fence; but the Honey Locust does not require as much protection. In Saline county hedges do well, and Osage and Honey Locust are both successful. For wind breaks, Box Elder, and Willow are used, though most wind breaks are of Cottonwood.

MR. WINSLÖW: Do you mean that there are no failures in hedge planting?

MR. STEPHENS: There are failures, but none where the hedges are intelligently handled.

WILLOW FOR HEDGING.

MR. BUDLONG: I have planted Willow, and it does very well.

MR. STEPHENS: Willow makes a good wind break; but not a good hedge.

THE PRESIDENT: In Nemaha county we have some good hedges of Gray Willow, woven together; but the objection to such hedges generally is that stock break through. The best material for

hedge—the plant with which we have had the most success—is the Honey Locust.

MR. BUDLONG: I have on upland one mile of Gray Willow fence planted on the 6th of May, two years ago, and clipped back, and the plants are now the size of my wrist. This spring I shall cut it back, and if the growth is good as heretofore, in the fall it will turn stock. One of my neighbors commenced with Osage; but I shall commence four miles more of Willow hedging in spring. In preparing my hedge row I get a furrow 15 inches deep for the plants. I believe weaving is not absolutely necessary, but I shall weave the fence.

HEDGE PLANTING IN NEMAHA.

—THE PRESIDENT: In Nemaha county we have planted largely, and generally we have been as successful as our neighbors. From experience and observation I endorse Mr. Barnard's views in the matter of planting, and Mr. Madison's in pruning, though I have seen good hedges produced by simply turning up the prairie with two furrows, planting the hedge, and setting the sod back as mulch. But I am no advocate of slovenly processes, and prefer the slower and more certain methods. For this reason I would not put in hedge plants with the plow, though with the plow quicker but not so good work is made.

MR. MADISON: When a man gets used to the work he will put in 80 rods with the spade per day; and, following my plan of clipping, the great labor of cultivating year after year is rendered unnecessary. I throw in everything between the plants so that the second year I have not to cultivate; and after the first year the shade of the foliage keeps weeds down.

MR. BUDLONG: I have had no experience in the cultivation of the Osage Orange in Nebraska, but I have had a considerable experience in Iowa; and I am an advocate of the plan of preparing the furrows 12 to 15 inches deep, planting by hand, and covering the plants as they are put into the ground. I plow down smooth and roll with a roller. If the plants are good, even should they be covered four inches deep, they are sure to get out of the ground.

A WORD FOR THE PLOW.

MR. STEPHENS: During two years I set out 30 miles of hedge by hand before adopting the plan I now follow, which I have explained, and which has succeeded well in my experience. I would like to ask Mr. Madison if the Osage Orange is not likely to grow too late in the fall if trimmed in the way he describes.

MR. MADISON: No. I cut back in September, and throw the sap into the lateral branches, ripening the wood and getting it into the best condition for winter. I do not protect only to throw the dirt against the hedge with the plow. Mulching encourages and protects vermin.

MR. STEPHENS: Osage Orange will not winter kill if the wood be ripe when winter comes.

ARBORICULTURE IN NEBRASKA.

The following are the parts of the reports relating to Arboriculture:

OTOE COUNTY.

Mr. Pearman writes on

FOREST CULTURE FOR NEBRASKA.

I also find that in the cultivation of forests, it is the best plan to plant such varieties as the Almighty placed here for us, and can be found most anywhere along the river and creek bottoms throughout the West.

NATIVE TREES THE BEST.

It is true many of the imported species grow well in Nebraska, but as a general thing, those indigenous to our soil give the most satisfaction, and such being the case, the man of limited means

has no money to spend in the "experimental business." In planting a grove or forest, I find too many people have adopted the idea that each species of our native timber should be planted to itself; and in many instances I see large groves of the black walnut, then soft maple; next we find ash, elm, oak. This I consider altogether wrong; and not according to the way Nature has planted her native forest. The close observer will notice in passing through our native forests, not only in Nebraska, but in other states, that wherever he finds the prettiest and best building timbers, he invariably finds it growing in a forest composed principally of the species native to that region of country. For instance, in Nebraska, he finds the different kinds of oak, ash, coffee-bean, elm, hickory, bass-wood, wild cherry, and black walnut, all growing in the same forest, and each one seemingly trying to excel his neighbor in beauty and symmetry.

In those forests it is not difficult to find nice building timbers such as the wants of the country demand. But you take and plant the same varieties in forests to themselves; and they do not grow so fast, nor do they form such nice trees as when grown promiscuously. Why such is the case I cannot tell, but such is the fact nevertheless.

Cottonwood and soft maple, which absorb a greater amount of moisture than the varieties above mentioned, seem to do better in groves to themselves, and large forests on the Missouri river of such timber are of frequent occurrence. These two varieties do well on our uplands also, but should be planted to themselves, and the damper the location, the better they will thrive.

TWENTY YEARS AGO

cord-wood sold in Nebraska city for seven or eight, and sometimes as high as ten dollars a cord, and that too, at a time when her population was not one-fifth what it is now; but notwithstanding the demand for fuel is at least ten times greater now than in 1857, it is a fact that good merchantable wood can be bought in our streets now from three dollars and fifty cents to five dollars per cord. The reason of this is simply from the fact that the natural groves have been protected from fire, and the artificial groves are turning out an abundance of good wood such as the necessities of the country demand for fuel. It will agreeably surprise any one not ac-

quainted with the facts, to know the amount of timber one acre of land will produce in the course of ten years.

A SETTLER GROWING HIS OWN LUMBER AND FIRE-WOOD.

Mr. Richard Justice, who came here in 1857, and planted about ten acres of cottonwood in 1859, has one or two out-houses built from hewed logs taken from that grove, and the family has all the fuel they need. Hundreds of such cases might be mentioned throughout the eastern portion of the State did space permit.

ADVICE TO PRAIRIE FARMERS.

To our new friends in the central and western portion of Nebraska, who are planting young forests quite extensively, let me urge them to continue the good work, and the time is not far distant when they too will have all the fuel they need, and some to spare. Plant such varieties as are adapted to our climate and soil, and your work will not have been done in vain.

NEMAHA COUNTY.

Mr. Aldrich reports the

SUCCESSFUL GROWTH OF NATIVE EVERGREENS.

In April, 1868, I obtained from the bluffs on Mission Creek, near the Otoe Indian Reservation, about 700 young Red Cedar trees, the most of them being from 2 to 3 inches high—some were 6 to 8. I planted these four inches apart, in rows one foot apart, and mulched them almost out of sight with fresh cut green grass, and renewed the mulch as often as occasion required, so as to keep the surface moist even in the hottest weather. The plants were not shaded at all, and at least ninety-five per cent. lived. After being in this nursery-bed two years 420 of them were then removed to their position to partly enclose my prospective lawn and garden, being set six feet apart in a single row. They were then from six to twelve inches high, and there was not a tree lost by this removal. They were then cultivated five seasons as thoroughly as

good farmer cultivating corn, beginning 1st of May and ending the 15th of July. Now the cedars are from 7 to 12 feet high, two-thirds as wide as high, and well branched from the ground. Some of these trees have been manured very heavily, others not at all, and the former are much the larger and finer every way. Evergreens require peculiar treatment. In some respects this can be learned from books, but to make them *grow* cultivate and manure.

RICHARDSON COUNTY.

Mr. Long considers

PRAIRIE FARMERS NEGLIGENT, BUT TREES WILL GROW.

In forest growing the prairie farmer is negligent; and if we had not been, we should have twenty trees for every one we now have growing. When I bought my farm there were about two acres of cottonwoods set to the north of my dwelling. At first I did not like them; but now, at the expiration of four years, I would not take \$500, and have them taken up. I have had some success with the Austrian and Scotch pine; but I have not a large present faith in the growth of evergreens.

Mr. Gird writes of

FINE ARTIFICIAL GROVES.

We have some very fine planted groves of forest trees in our vicinity; but there has not been that attention paid to forest planting which the importance of the enterprise demands.

PAWNEE COUNTY.

Mr. Barnard reports

FIVE HUNDRED ACRES OF ARTIFICIAL GROVES.

There are not far from 500 acres of thrifty artificial groves in this county, beside wind-breaks and groves of less than one acre. Cottonwood and soft maple predominate, with some ash, walnut, elm, and honey locust, the latter being in some use for hedging, but it does not meet with much favor. The ash, which is a valuable timber tree and indigenous, makes good growth, and is free from vermin.

SAUNDERS COUNTY.

Mr. Lansing forwards

STATISTICS OF FOREST TREE GROWTH—HAVE TEN PER CENT. OF THE FARM IN TREES.

The majority of our farmers have groves covering one to fifteen acres each; and Saunders county is the peer of any county in the State for the number and beauty of her artificial groves. But we shall not reach the profit maximum of tree planting until 10 per cent of every farm is devoted to thrifty growing forest trees; and timber growth should therefore be encouraged in every way. The trees mostly planted are cottonwood, maple, walnut, ash, elm, box-elder, and Lombardy poplar; and among the evergreens the cedar, Scotch pine, Norway spruce, etc. My grounds show growths as follows:

	ALTITUDE.	DIAMETER.
Cottonwood - - -	28 feet.	9 inches.
Soft Maple - - -	22 "	6 "
Ash - - - - -	19 "	6 "
Elm - - - - -	20 "	6 "
Box-Elder - - -	19 "	7 "
Lombardy Poplar - - -	24 "	4½ "
Cedar - - - - -	12 "	4½ "
Balm of Gilead - - -	12 "	4 "



VIEW IN ANTELOPE COUNTY, NEBRASKA.

LANCASTER COUNTY.

Prof. Culbertson, B.A., reports on

ARTIFICIAL GROVES IN LANCASTER COUNTY.

There are a good many groves in the county, though not so many as in the older counties; and the groves in the eastern part of the county are much the best. Cottonwood constitutes at least nine-tenths of all the groves. In the vicinity of Lincoln, however, the tree planters do not so much favor the cottonwood exclusively. They have more variety, some preferring black walnut, some ash; some box-elder. There is still considerable natural timber along the creeks in some places; but it is being destroyed pretty fast for fuel.

JEFFERSON COUNTY.

Mr. Andreson reports on

THE FOREST GROWING OF JEFFERSON.

Farmers do not show sufficient interest in forest growing—a fact which is a matter of wonder, seeing that the laws favor tree growing; and also when we consider the value, beauty, and comfort on the farm, which results from the healthful and rest-giving presence of trees. Yet, though I do not think our farmers have done their duty in this important matter, we have made some progress in arboriculture, and the interest in the subject is increasing. Last year one of my customers planted about 8000 ash, besides other varieties of forest trees. This person had previously planted over 1,000 of the above, which now completely shade the ground; some of the trees being nearly ten feet high, and very fine and branched. They were grown in my grounds, and transplanted four years ago. Our favorite kinds are ash, soft maple, ash leaved maple, and walnut. Cottonwood is not a favorite, though planted because of its rapid growth, which is about equal to gray willow with us.

YORK COUNTY.

Mr. Stilson reports about

THREE HUNDRED ACRES IN PLANTED TIMBER.

Forest tree culture has received very much more attention than fruit growing; and there are numerous fine groves growing in all parts of the county which have been set one to five years, the timber being mostly cottonwood. There are from 250 to 300 acres planted in timber, besides what we have in wind-breaks, set out on boundary lines, etc. The law exempting from taxation a certain amount of property for tree planting, is a great encouragement to the work; and the farmers desire the present law to be sustained unless the Legislature will give us a better one. For 1876, there was \$21,675 worth of property in York county, exempted from tax for timber and orchards in cultivation.

FILLMORE COUNTY.

Mr. Brown states that there are

THREE AND A HALF ACRES OF TIMBER TO EACH FARM.

The number of acres planted to timber in Fillmore is 3,360, which gives $3\frac{1}{2}$ acres to each farm of 160 acres in the county. About 2,000 of these acres are in cottonwood; 1,000 in ash and box-elder; 350 in soft maple, honey locust, and black walnut; and the remaining ten acres in fancy varieties—this estimate (and also the estimate of hedge) not including the extensive plantings of the Burlington & Missouri River Railroad Company on the very highest lands of the county, on the edges of the railroad cuttings.*

* At the close of 1875, Mr. E. F. Stephens, of Crete, forester of the Burlington and Missouri River Railroad Company of Nebraska, reported that from 1872 he had planted the north sides of the shallow cuttings, which occur at intervals on the road, from west of Lincoln to the Platte river, at Kearney. The work was done on the highest points of

During the coming spring, there will be planted in Fillmore from 1,500 to 2,000 acres of timber due to the large number of timber claims. With the exception of the soft maple, all species of our native timber thrive on the table lands. The thornless honey locust is growing in favor with our planters, the tree being of rapid growth and making good timber. Among the finest groves in the county are those belonging to Messrs. Merriman, O. C. Brown, and David Lee, of Stanton township; and Messrs. H. F. King, J. T. Blair & Robinson, of Chelsea.

CLAY COUNTY.

Mr. Dinsmore shows

ARBORICULTURE A SUCCESS.

We have many groves of forest trees, some considerable number of which will reach from 3 to 15 or 20 acres in extent; and where the trees have been cultivated and cared for, they are in good and

the prairie table land, the ground broken for the purpose comprising 186 acres, the length of the several planted plats being $28\frac{1}{2}$ miles. 460,000 trees were planted in seven rows, the north rows being honey locust, for a hedge. The other six rows were seven feet apart; and the species used were soft maple, box elder, sugar maple, white elm, laurel leaved willow, cuttings of white willow and cottonwood, and evergreens. The ground was well cultivated; and in the fall of 1873 the following percentages of thrifty life were found: ash, 98 $\frac{5}{8}$ per cent.; honey locust and box elder, 92 per cent.; soft maple, 88 per cent.; evergreens, 81 per cent.; and the willow and cottonwood cuttings, 75 per cent. The ground was frequently unfavorable—often clay from the bottom of the excavation for the cuts, and the banks slacked down, exposing the tree roots. Notwithstanding this, Mr. Stephens thinks the evergreens would have shown a living per centage of 95, if it had not been for 8,000 Norway spruce, which, never having been transplanted, were too weak for the raw soil and exposed situation. In the spring of 1874 vacancies were filled with one year old green ash, native to the country; but an unfavorable season for trees again caused some loss. In 1875 the trees made a remarkable growth—cottonwood, 6 feet; willow, 4 to 8 feet; and the honey locust hedge, having been twice cut back to make it thicken up, was 5 feet high; the evergreens being well established. In many of the groves the trees were tall enough and thick enough to be efficient snow breaks. Mr. Stephens considered the experiment successful; but, if the work were to do again, he would confine himself exclusively to native trees, and plant black walnuts. In groves about the house, and inside wind breaks, Mr. Stephens considered the evergreens reliable growers, and he had 8,000 in his ground which he managed as well as deciduous trees.—R. W. F.

healthy condition. Of the species tried, the cottonwood and box-elder stand pre-eminent, and the success achieved demonstrates conclusively that our prairies may in a few years be dotted with fine groves of timber. As yet there has been no systematic hedge planting in Clay county.

FURNAS COUNTY.

Mr. Ayres thus figures

NATURAL FOREST GROWTH IN THE REPUBLICAN VALLEY.

Our natural forest growth is 4,880 acres, or about one-ninth of the area of this county; but artificial groves are also being planted to a considerable extent, the species in favor being principally ash, box-elder, walnut and cottonwood.

BUFFALO COUNTY.

Mr. Bassett says that in this county there is

MUCH TREE PLANTING, BUT FARMERS NEED EXPERIENCE.

In forest planting most farmers have made a beginning, having planted from one to ten acres each on their farms. Some have surrounded their quarter sections with a row of trees; others have used trees to divide the quarter into two eighties, while others have fenced off each forty acres with a row of trees. We are at the beginning of our work in forest growing, and in my judgment we need education, as well with reference to cultivation as planting, and the species which ought to be planted. We have gained something from experience, however. Our native cottonwood will grow most anywhere; but we have found that when this tree is grown alone its growth is so rapid—the wood failing to ripen—that it is liable to winter kill. The young trees, however, are amply pro-

tested when we raise with them some other crop. I repeat that we need instruction in this western region in the matter of tree planting, as want of experience renders failures possible. For instance, we have not had much success with soft maples, though we have planted great numbers; and for myself I have not succeeded in raising the chestnut and the oak either from seed or young trees; but such black walnuts as have been planted in the county are thrifty. In Buffalo much land has been taken up on timber claims, which involve considerable labor to make them operative; and from what I know I would say that the timber claim law must be considerably amended before it will fully accomplish its object.

HALL COUNTY.

Mr. Stolley reports his

TREE PLANTING OPERATIONS, AND TELLS HOW HE DEALS WITH INSECTS.

I planted the first artificial grove in Hall county in the spring of 1860. The trees were 3,000 each, cottonwood and black locust seedlings, and a few hundred black walnuts and native ash trees. The cottonwoods now average 65 to 75 feet in height; black locusts, 25 to 35 feet; and ash and black walnuts about 25 feet. In my grove there are numerous insect-eating birds; but, notwithstanding, insects are troublesome. In 1870 I noticed the working of the borer, and only the black walnut trees have entirely escaped. If applied in time—and during the spring when the flowing sap is ascending the tree—pulverized sulphur is effective in driving out borer. As near to the ground as possible, I bore two inch holes opposite each other in a tree, and put in two teaspoonfuls of the sulphur, and then plug the holes tightly. Of course this is a slow process, and is scarcely applicable except for choice individual trees; and the remedy must be applied before the trees have suffered too much. Where the forest trees were grown close (6x6 feet) the borer has done more harm than when the trees have stood 8x8 feet apart, while trees standing alone and allowed to form a good top have not been attacked at all. Since 1870 I have filled

spaces in my grove with young hard-wood trees—black and white walnut, ash, elm, and box-elder—partly by planting nuts and seedlings and partly by sowing the seed broadcast in winter and early spring, so that I have now got an excellent young growth well started promising fair. I may add that the little borer which is found mostly in the forks of small limbs and young shoots, I have noticed for three or four years; but I have not suffered greatly from them on account of the many birds in my grove, and which assist me in their destruction; but I know no better way of preventing mischief than to look for the borer on young trees during fall and winter, and kill them in their holes.

ACREAGE IN TREES.

I estimate that the artificial groves of Hall county cover an area of about 500 acres, the cottonwood predominating. Thousands, however, of elms, ashes, box-elders, soft maples, etc., have been planted in addition, and these are doing well.

STATE FORESTRY.

I would not leave, however, the increase of timber in the State altogether to private enterprise. European countries have a system of forestry which protects timber and promotes its growth; and I think that such a system here would produce incalculable good. A certain portion of the public lands should be set aside for this purpose; and groves covering 160 acres should be planted in different parts of each county. If it pays private persons to grow timber, it should pay the State also; and, considering the great interests at stake, it seems to me it will.

BURT COUNTY.

Mr. Canfield reports

TWO THOUSAND FIVE HUNDRED ACRES PLANTED.

There are about 2,500 acres of forest trees planted in the county, most of which are cottonwood, with a small sprinkling of soft

maple, black walnut, elm, and willow. A law ought to be passed, making it the duty of each precinct assessor to report to the county clerk for record, the number of fruit trees growing, the number of acres in forest trees, and the number of rods or miles of successfully grown hedge, specifying the kind of plant of which it is composed.

WASHINGTON COUNTY.

Mr. Stewart's report is that

FARMERS ARE PLANTING.

We have not much hedging, but farmers are paying attention to forest tree growing, the species most chosen being cottonwood, box-elder, soft maple, and ash.

Mr. Bowen reports that

MANY FARMERS HAVE GROVES.

Forest tree planting has not been pushed to the extent which is desirable; but very many of our farmers have groves of planted timber which is doubly beneficial, affording both shelter and fuel.

DISCUSSION

as to timber culture was brief, and was confined to

WIND-BREAKS: THEIR SIZE, AND THE PROTECTION THEY AFFORD.

MR. STEPHENS: It will be advisable to say something as to wind-breaks—how wide they should be, how many rows of trees they should consist of, and whether they should be planted all round the orchard.

MR. J. W. MESERVE: What should be the size of the wind-break for forty acres?

MR. WINSLOW: Six rows of trees: that is just enough

MR. BARNARD: A wind-break will protect an orchard a rod for every foot it is high. We only, however, want them on the south side; and, at most, the west side of the orchard. To surround the orchard with a dense wind-break is to restrict the sunlight and the air to the injury of the orchard, and especially of the peach trees.

MR. BUDLONG: In my wind-breaks on the south, I have planted two rows of white willow which are six or eight feet high, at two years' growth and twelve feet apart. I have also planted four rows of cottonwood, 16 feet apart; and four rows of black walnuts, the same distance; on the east and west, rows of willow; and on the north, willow and black walnut.

PROFESSOR THOMPSON: When an orchard is established and the trees are old, they are a wind-break for themselves. It is the young orchard which we need to protect against the worst summer winds, and trees 25 feet high will not protect against the wind for more than four or five rods from their inner border. This consideration should be remembered in planting orchards, as an orchard of forty acres can only be partially protected by a wind-break; and for full protection in large orchards there should be a wind-break every ten rods.

MR. WINSLOW: The lay of the land has a good deal to do with the protection which an orchard receives from a wind-break. One tract will be largely protected by the wind-break, while another laying differently, and being differently shaped, will scarcely receive any protection at all.

PROFESSOR THOMPSON: Yes, there are some places where the orchard can be protected without a wind-break.

BIRDS AND INSECTS—HOW TO DEAL WITH THE PROBLEMS THESE PRESENT.*

The following are the portions of the reports dealing with the above subject:

NEMAHA COUNTY.

Mr. Aldrich has a good opinion of

HOGS IN THE ORCHARD.

The first four years after planting my orchard, the trees were badly infested by insects. Since then—for a part of the year—my young shotes have had the run of the orchard, and insects have nearly disappeared.

* The following is an incomplete list of the birds found in Nebraska. The list has been supplied by Mr. M. D. Tiffany, taxidermist, of Lincoln, and represents birds which have passed through his hands, the nomenclature being that of Cones: *turdus migratorius*, robin; *t. mustelinus*, wood thrush; *t. naevius*, varied thrush or Oregon robin (doubtful); *t. pallasi*, hermit thrush (doubtful); *t. swainsoni*, olive-backed thrush; *seiurus noveboracensis*, water thrush; *s. ludovicianus*, large-billed water thrush; *oreoscoptes montanus*, mountain mocking bird (rare); *mimus carolinensis*, cat-bird; *harporhynchus rufus*, sandy mocking bird, or thrasher; *sialia mexicana*, western blue bird; *regulus satrapa*, golden-crested kinglet; *polioptila caerulea*, blue-gray gnat catcher; *parus atricapillus*, black-capped chickadee; *sitta carolinensis*, white bellied nuthatch; *s. pygmaea*, pygmy nuthatch; *certhia familiaris*, brown creeper; *troglodytes aedon*, house wren; and var. *parkmanni*, western house wren; *telmatodytes palustris*, long-billed marsh wren; *cistothorus stellaris*, short-billed marsh wren; *mnioilta varia*, black-and-white creeping warbler; *parula americana*, blue yellow-backed warbler; *helmitherus vermivorus*, worm-eating warbler; *helminthophaga chrysoptera*, blue, golden-winged warbler; *dendraeca aestiva*, blue-eyed yellow warbler; *d. virens*, black-throated green warbler; *d. caerulea*, black-throated blue warbler; *d. coronata*, yellow-rump warbler; *d. striata*, black pole warbler; *d. castanea*, bay-breasted warbler; *d. pennsylvanica*, chestnut sided warbler; *d. dominica*, yellow-throated warbler; *icteria virens*, yellow-breasted chat; and var. *longicauda*, long-tailed chat; *setophaga ruticilla*, redstart; *pyrranga rubra*, scarlet tanager (rare); *hirundo horreorum*, American barn swallow; *petrochelidon lunifrons*, cave swallow; *cotyle riparia*, bank swallow; *ampelis cedrorum*, cedar bird; *vireo olivaceus*, red-eyed vireo; *v. gilvus*, warbling vireo; *v. flavifrons*, yellow-throated vireo; *v. noveboracensis*, white-eyed vireo; *collurio borealis*, northern shrike; *c. ludovicianus* var. *excubitoroides*, white-rumped shrike; *pinicola enucleator*, pine grosbeak; *carpodacus purpureus*, purple finch; *loxia curvirostra*, red crossbill; *l. leucoptera*, white-winged crossbill; *aegeothus linaria*, redpole linnet; *chrysomitris pinus*, pine linnet (rare); *c. tristis*, American goldfinch (rare); *plectrophanes nivalis*, snow-bunting; *p. ornatus*, chestnut colored bunting; *melospiza melodia*, song sparrow; *poocetes gramineus*, bay-winged bunting; *junco hyemalis*, eastern snow bird;

RICHARDSON COUNTY.

Mr. Long

WOULD PREVENT THE KILLING OF BIRDS.

I would like to have a law passed inflicting a heavy fine on every person shooting or trapping a bird for at least three years to come, for we have not sufficient birds to deal with the insects. If grasshoppers come again, I propose to prevent them crawling up the trees by placing a shield of tin round the bole eight or ten inches from the ground, the tin extending from the bole four to eight inches, and being turned down at the circumference. These tins would cost from \$2 to \$3 per 100, according to size; and I believe that, should the necessity arise for their use, they will be effectual. To protect the tree below the tin, use a heavy coat of whitewash.

spizella monticola, tree sparrow; *s. socialis*, chipping sparrow; *s. pusilla*, field sparrow; *s. pallida*, clay-colored sparrow; *zonotrichia albicollis*, white-throated sparrow; *chondestes grammacus*, lark finch; *goniphea ludoviciana*, rose-breasted grosbeak (rare); *cyanospiza cyanea*, indigo bird (rare); *cyanospiza amœna*, lazuli finch (rare); *cardinalis virginianus*, cardinal grosbeak, Virginian red bird; *pipilo erythrophthalmus*, ground robin, marsh robin, towhee bunting; *dolichonyx oryzivorus*, bob-o-link, reed bird; *molothrus pecoris*, cow blackbird; *agelaius phœniceus*, red-winged blackbird, and var. *gubinator*, red-shouldered blackbird; *xanthocephalus icterocephalus*, yellow-headed blackbird (very common); *sturnella magna*, meadow lark; *icterus spurius*, orchard oriole; *i. baltimore*, Baltimore oriole; *i. bullockii*, Bullock's oriole (rare); *scolecophagus ferrugineus*, rusty crackle; *s. cyanocephalus*, blue-headed crackle; *quiscalus purpureus*, purple crackle; *corvus corax*, raven; *corvus americanus*, common crow; *pica melanoleuca*, American magpie, var. *nuttalli*, yellow-billed magpie; *cyanurus cristatus*, blue jay; *tyrannus carolinensis*, king-bird; *t. verticalis*, Arkansas fly-catcher; *myiarchus crinitus*, great crested fly-catcher; *myiarchus cinerascens*, ash-throated fly-catcher; *contopus (virens var.?) richardsonii*, western wood pewee; *empidonax acadicus*, Acadian fly-catcher; *e. traillii*, Traill's fly-catcher; *e. minimus*, least fly-catcher; *e. flaviventris*, yellow-bellied fly-catcher; *antrostomus nuttalli*, Nuttall's whip-poor-will; *chordeiles virginianus*, night hawk; *chætura pelagica*, chimney swift; *trochilus colubris*, ruby-throated humming bird; *ceryle alcyon*, belted king fisher; *coccyzus americanus*, yellow billed cuckoo; *picus pubescens*, downy woodpecker; *picoides arcticus*, black-backed three-toed woodpecker; *sphyrapicus varius*, yellow-bellied woodpecker; *centurus carolinus*, red-bellied woodpecker; *melanerpes erythrocephalus*, red-headed woodpecker; *colaptes auratus*, golden-winged woodpecker; *c. mexicanus*, red-shafted woodpecker; *conurus carolinensis*, Carolina parroquet; *strix flammea*, barn owl (rare); *scops asio*, red owl; *otus vulgaris*, long-eared owl; *brachyotus palustris*, short-eared owl; *syrrium cinereum*, great gray owl; *s. nebulosum*, barred owl; *speotyto cunicularia*, burrowing owl; *circus cyaneus*, marsh hawk; *nauclerus forficatus*, swallow-tailed kite; *accipiter fuscus*, sharp-shinned hawk; *a. cooperi*, chicken hawk; *astur atricapillus*, goshawk (rare); *falco columbarius*, pigeon hawk; *falco sparverius*, sparrow-hawk; *bubo*

Mr. Duerfeldt thus

PROTECTED HIS TREES.

When the grasshoppers came two years ago, I protected my young trees with a solution of chloride of lime, copperas and turpentine, and suffered no harm; and I think gas tar on the trunks will be effectual against the young. For the smaller insects, I would recommend the importation of the European sparrow, which can be obtained at Buffalo, and also at New York City.

JEFFERSON COUNTY.

Mr. Andreson tells of his

REMEDIES FOR INSECTS, AND THE USEFULNESS OF BIRDS.

Insects most injurious, and known here, are the common borer, entering the body of tree near the ground, and the beetle which

borealis, var. *calurus*, red-tailed buzzard; *archibuteo lagopus*, rough-legged hawk; *haliaetus leucocephalus*, bald eagle; *zenaidura carolinensis*, Carolina dove; *meleagris gallopavo*, wild turkey; *centrocercus urophasianus*, sage cock; *pedicæstes phasianellus*, sharp-tailed grouse; *cupidonia cupido*, pinnated grouse, or prairie hen; *bonasa umbellus*, ruffed grouse; *ortyx virginianus*, quail; *squatarola helvetica*, black bellied plover; *charadrius fulvus*, golden plover; *ægialitis vocifera*, kill deer plover; *æ. semipalmata*, ring plover; *æ. meloda*, piping plover; *recurvirostra americana*, avocet; *philohela minor*, American woodcock; *gallinago wilsoni*, American snipe; *macrorhamphus griseus*, red-breasted snipe; *micropalama himantopus*, stilt sandpiper; *ercunetes pusillus*, semi-palmated sandpiper; *tringa minutilla*, least sandpiper; *t. maculata*, grass snipe; *t. fuscicollis*, Bonaparte's sandpiper; *t. canutis*, red-breasted sandpiper; *limosa fedoa*, marbled godwit; *totanus melanoleucus*, greater yellow shanks; *t. flavipes*, lesser yellow shanks; *tringoides macularius*, spotted sandpiper; *actitis bartramius*, upland plover; *tryngites rufescens*, buff-breasted sandpiper; *numenius longirostris*, long-billed curlew; *ardea candidissima*, snowy heron; *a. herodias*, blue heron; *a. virescens*, green heron; *nyctiardea grisea*, night heron; *botaurus minor*, American bittern; *ardetta exilis*, least bittern; *grus americana*, white crane; *g. canadensis*, sandhill crane; *rallus elegans*, king rail; *r. virginianus*, Virginia rail; *fulica americana*, coot; *branta bernicla*, brant goose; *b. canadensis*, common wild goose; *anas boschas*, mallard; *asfla acuta*, pintail; *mareca americana*, widgeon; *querquedula carolinensis*, green-winged teal; *q. discors*, blue-winged teal; *q. cyanoptera*, cinnamon teal; *spatula clypeata*, spoonbill; *ais sponsa*, wood duck; *fuligula marila*, big black-head; *f. affinis*, little black-head; *f. collaris*, ring-necked duck; *bucephala clangula*, golden eye; *b. albeola*, dipper; *histrionicus torquatus*, harlequin duck; *erismatura rubida*, ruddy duck; *mergus merganser*, sheldrake; *m. serrator*, red-breasted merganser; *m. cucullatus*, hooded merganser; *pelecanus trachyrhynchus*, white pelican; *larus argentatus*, herring gull; *sterna hirundo*, common tern; *podiceps occidentalis*, western grebe.—R. W. F.

works in the forks of the tree. To destroy them I build frequent fires, through my grounds, from May 1st to middle of June. The fires are made by burning all the rubbish that accumulates about the orchard and nursery, such as weeds, grass, corn stocks, etc.; if these are not to be found on carefully kept grounds, a part of a load of old straw thrown in bunches through the drives, is what we use, and is good. Fire this in the evening, and the moths will destroy themselves, being attracted by the light. A frequent washing with lye, from ashes, is necessary also, and will be found to contain much essential fruit-producing plant food. Birds are always made welcome and encouraged to build amongst the trees, and hatch their young. What of strawberries and their favorite cherry and raspberry they are accused of foraging? My experience proves that, for all they take of fruit, they pay in gold, in advance, by their destruction of harmful insects, and other enemies to tree growers. Oh, yes, welcome the beautiful birds.

SAUNDERS COUNTY.

Mr. Stocking considers

CHICKENS AND YOUNG HOGS USEFUL IN ORCHARDS, AND WOULD NOT
BURN GRASS UNTIL SPRING.

In former years the curculio and tent caterpillar, especially the latter, have proven troublesome to the wild plum. If young hogs and chickens were allowed free access to orchards, after they come into bearing, they would do much towards ridding them of troublesome insects. As regards insects, the prevailing sentiment—except among those who are too lazy to labor, and who depend on the chase for subsistence, favors a law which shall protect all insect-eating birds at all seasons of the year for a period of three, five, or more years. Also a law strictly prohibiting the burning of prairie grass, except in the spring. The grass is one of Nature's agents for protecting the earth during winter; and it also affords shelter to many species of insectivorous birds during the inclement

weather; holds ammonia which enriches the soil; holds the snow which ameliorates climate; and in the spring is a ready fuel to destroy insects when the need arises.

LANCASTER COUNTY.

Prof. Culbertson, B.A., writes about

REMEDIES FOR BORERS.

The flat-headed borer which works in the body of the apple tree can be kept out by keeping the trees growing, and in vigorous health. The best way to operate against the limb borer is to go through the orchard in the early part of March, and cut off the limbs of which they have taken hold, and burn them. Some of the groves near Lincoln have been injured by the cottonwood beetle, which insect I have not heard of at any place except the north-east of Lincoln, and within four miles of the city. The perfect insect looks like the potato beetle, except that it is about half the size, and is of a darker color. The insects hybernate in winter in piles of trash, and in cracks about buildings and fences. Their first appearance in spring is about the time of the first appearance of the cottonwood leaves; but if the leaves are not out, they will take other leaves or rotten wood. The eggs are laid under the lowest leaves in clusters, and in a few days they hatch out. They have an odor resembling the bruised cottonwood leaf, but much stronger. In two weeks or less they get their larva growth, and when they are touched they excrete a milk-white substance from a row of little raised places on each side of the body. In passing through their transformation they attach themselves to the under side of the limbs, or of fence boards, and often on the under side of a crook on the tree, and in clusters. In two weeks the change is completed, and the insect is flying.

SEWARD COUNTY.

Mr. Waterman has a high opinion of the

USES OF BIRDS.

We ought to have a law forbidding the killing of prairie chickens and quails,* for these birds are truly the friends of the farmers; and in return for the benefit which he derives from them they lay on him but a light tax, doing but little damage, unless corn is left

* For many years there has been on the Statute book of Nebraska an Act which prohibits the destruction of small birds, useful in agriculture, beautiful in plumage, and pleasing in song. Unquestionably this law has had a good effect, and that because the law has represented a large and enlightened public opinion. In a new country, where population is sparse, a law of this kind is difficult of enforcement unless it has the public approval. It has been a vice in American society, from the east to the west, that there has been little discrimination in the slaughter of the free denizens of Nature. As well as the small birds, birds and beasts of game have been recklessly destroyed when there has been no economical necessity therefor. A change has, however, come, and there is strong public sentiment in favor of a wise system of preservation which, in many of the eastern states, is re-stocking the woods and wild lands with game. On the prairies, as they are by nature, small birds are not numerous; but they come—ever spreading westward—with spreading cultivation; and those who have resided in the State for some years must have noted their continual and large increase. They are numerous in the river counties, among the wooded bluffs; and everywhere on the prairie, where there are planted groves, the small birds make their home, and also in the timber on the creeks. The law passed by the Legislature of Nebraska in the session of 1877—the law which was pending as a bill when the meeting of the Horticultural Society was held—was passed at the instance of the agriculturists of the State, Professor Aughey having rendered good service in bringing public opinion to a focus on the subject. This law is in operation from the 1st of June, 1877; and it makes it unlawful to take, wound or kill any wild bird within the State at any season of the year, or destroy any wild bird's eggs or nest at any time, the Act, however, not applying to water fowls, jack snipes, sand snipes, waders, and woodcock. The penalty for the infringement of the Act is a fine of not less than \$5 nor more than \$15—for every bird or bird's egg, or nest—the offender being imprisoned in the county gaol until the fine and costs are paid. Of course, if birds increase too largely, the law will be modified; but at present the Act has the approval of the great body of agriculturists in the State. While on this subject it may be said that this seems to be the history of the prairie chicken (pinnated grouse, *cupidonia cupido*) which has been almost extirpated east, and is now nearly confined to the prairie. This bird is only moderately frequent on the wild prairie, its enemies and the limitation of food keeping it in check. When the prairie is first cultivated, food becomes abundant; and it increases rapidly about new settlements. In the first years man is not too strong for the chicken; but, as settlement spreads, man, as a destructive agent, more than balances the increase of food, and the birds greatly diminish in numbers, or are extirpated. Hence the necessity for protection.—R. W. F.

standing until late in the winter. In my grove there is a large flock of quails, of which not one has been killed by me, nor do I allow of their being killed by others. They travel through my orchard and among my small fruits, and in my flower garden, picking up bugs, worms, and the seeds of weeds, thus doing me incalculable good. If the representatives of Seward county promote the enactment of a law which will prevent their being killed by hunters, I shall consider they have done farmers good service.

FURNAS COUNTY.

Mr. Ayres would

PROTECT ALL INSECTIVOROUS BIRDS.

We ought to have a law to prevent the killing of quails, for at least four years; and grouse, if killed at all, should only be killed during the months of December and January. The present law compels the farmer to feed game for the benefit of sportsmen, and justice requires its amendment; but all insectivorous birds should be protected by the most stringent laws.

HALL COUNTY.

Mr. Stolley speaks of

SMALL BIRDS AND THEIR USES.

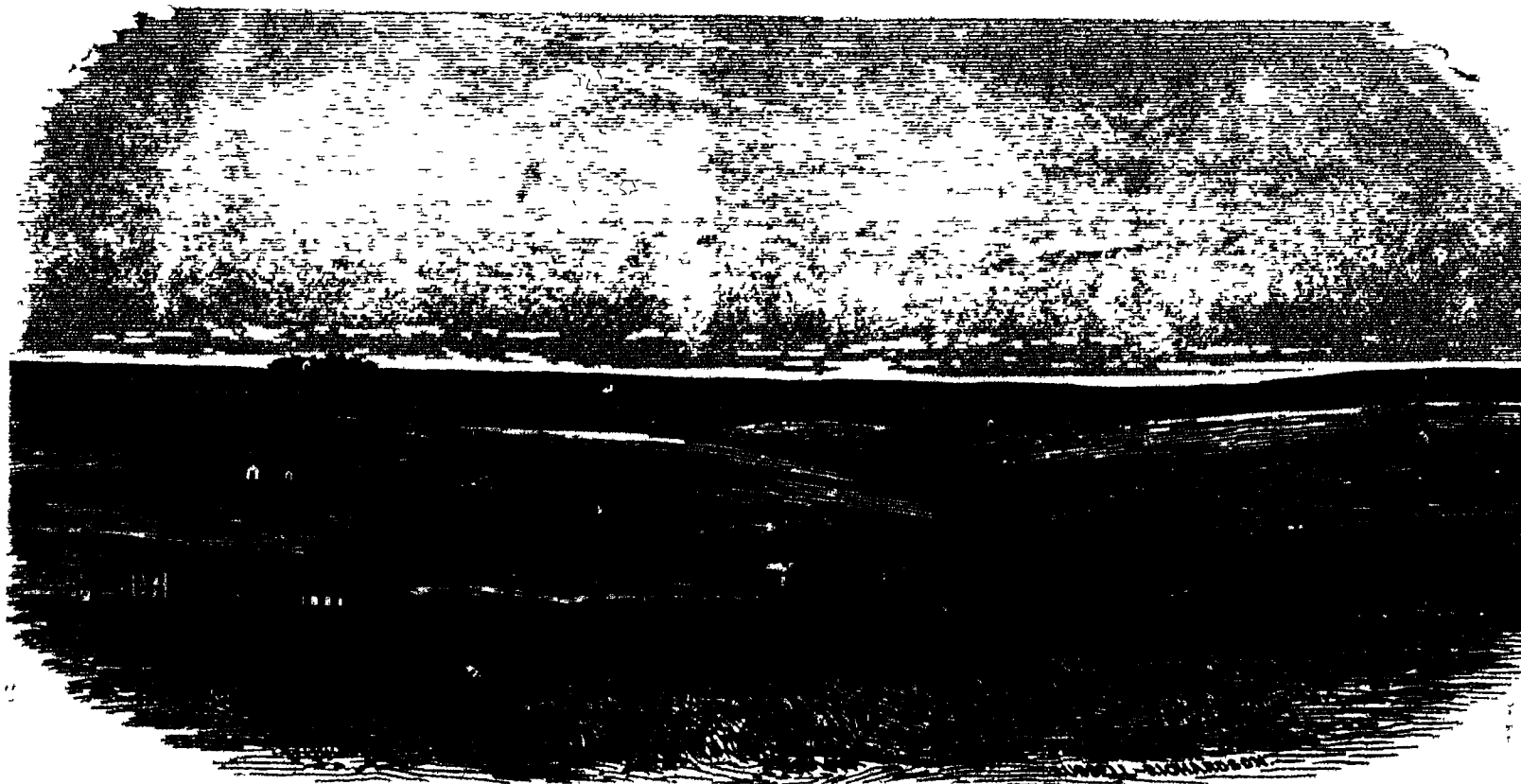
In the spring and summer we have more species of insect-eating birds than is generally supposed; and all that is needed to secure their presence everywhere is the planting of artificial groves over the prairies. But I am inclined to recommend the importation of such foreign birds as have been proved most effective in the destruction of insects; and among all these I would give the foremost

place to the so-called English sparrow. A few years ago I tried to introduce a dozen pairs from New York; but they were badly boxed and not properly attended to by the express company, and they died on the journey, except a few female birds which died immediately after arrival. Last spring, however, being at New York, I bought six pairs, bringing them with me, and losing but one pair on the way. I gave them liberty on May 1st; and during the summer the number of the colony increased to forty, and they have endured the winter season well. Would it not be advisable in all the Western States to introduce these birds? The sparrow, as well as other insect-eating birds, take a portion of their food in grain, but insects form the bulk of their food. If each Nebraska county would pay \$25 out of the general fund for as many pairs of these birds, Nebraska would have a standard bird which would keep obnoxious insects thoroughly in check. The northern parts of Germany are well stocked with sparrows; and twenty years ago each farmer was required to kill a given number of them annually. But insects increased *pro rata* with the destruction of the sparrow; and, therefore, some years ago the Prussian government revoked the order, and the killing of sparrows was prohibited.

And further Mr. Hall would

AMEND THE GAME LAW BUT NOT PROHIBIT THE KILLING OF GAME BIRDS.

Some of our men of science in the interests of agriculture urge that there should be no more hunting of prairie chickens, grouse, and quail; but I do not regard the position they assume as scientific. When wolves, foxes, and other game-destroying animals covered the prairie, there was not one chicken or grouse where there are a hundred now, after these animals have been largely destroyed, and there was not one quail where there are five hundred now. Wherefore, as it appears to me, the sportsman is necessary to keep the game in check, for though the operations of insect-eating birds make one of the greatest natural agencies in preventing the overgrowth of insects, yet, inasmuch as these birds consume considerable grain, and also when snow covers the ground pick off the young buds of trees—and also in view of their great increase even with the check of hunting—I regard the proposal to prohibit entirely the killing of game birds as a step in the



VIEW FOUR MILES SOUTH OF WELLS, P. O., ON LITTLE BLUE, WEBSTER COUNTY, NEBRASKA.

wrong direction. No doubt the proper amending of our game law would prove beneficial as regards prairie chickens, grouse, quails, wild pigeons, plovers, snipes, prairie larks, and other insect-destroying birds; and I would advise such amendment as would make the hunting season commence on the 15th of September instead of the 1st of August. This would shorten the time when these birds may be shot; and when it began the birds would be full grown, and could not be destroyed by wholesale, as they frequently are during the early part of the month of August.

WASHINGTON COUNTY.

Mr. Bowen would

PROTECT THE BIRDS.

We have, of course, insects which are injurious to trees. Borers get into the forest trees, and the ash suffers with the apple from a limb borer; and the leaves of the red or soft maple are blistered, in common with the grape, by an insect that forms a wart-like excrescence upon them. The general result of our operations is however most satisfactory and encouraging, though to keep down insects we should encourage insectivorous birds. Some fruit raisers regard the robin, blue-bird, Baltimore oriole, and some others, as likely to do more harm than good, and so also the sportsmen aver that the quail and prairie chicken are not insect-eaters but feed on the seeds of weeds and grain. Of course the question involved is one open to examination and proof; but, for the present, the wisest course seems to me to be to preserve the birds.

Mr. Craig uses

CARBOLIC ACID FOR INSECTS, AND WOULD PREVENT THE KILLING OF BIRDS.

In some young trees I notice a minute worm or maggot [the twig borer], which lies crosswise to the grain of the young twigs

penetrating the pith. In the early spring I shall give my trees a good soaking with a carbolic acid mixture, in order to destroy the insect. The killing of birds, especially the killing of quail and all small land birds, should be prevented at every season of the year.

DOUGLAS COUNTY.

Mr. McCoy thus

DEALS WITH INSECTS.

There is a beetle which injures grapes and apples, but in spite of all that has been written by scientific experts I find myself unable to distinguish between the grape and apple beetle. These beetles usually attack the vine or tree about the time of budding, immediately under the bud, and about say 16 inches or 2 feet from the end of the vine or tree. They work both ways in the wood, and if they are not looked after and killed in season they will destroy the part they attack. They are a small black bug from one-sixteenth to half an inch in length, and my remedy against them is carefully to examine daily for a week or ten days, every vine and tree, and with a pen knife or other sharp pointed instrument catch and kill the insects; or, if there appears to be any affected wood where there may be eggs, cut it off and burn it. Satisfactory results follow from this practice.

BIRD AND INSECT TALK.

PRESERVE THE LIFE BALANCE—SPARROWS IN CITY GROVES.

PROFESSOR WILBUR: We all understand the relation between birds and insects. The bird is an enemy of the insect, pursuing it and preying upon it; and it is our business to keep the balance of

life so poised that the birds shall dominate over the insects, and prevent these latter from being one of the most destructive agencies to which agriculture is subject. In the great eastern cities, not many years ago, the insects so infested every grove that the trees were defoliated. Sparrows were imported and the insects thoroughly checked; but the sparrow itself multiplied so as to become a nuisance in its turn. However, on these prairies our remedy against insects is to preserve the birds.

IF BIRDS ARE KILLED INSECTS WILL INCREASE—LOCUSTS NOT PERMANENT DENIZENS OF THE PLAINS.

PROFESSOR AUGHEY: I have been subject to many attacks on the part of a certain class of sportsmen in the state because of the action I have taken in urging upon the legislature the passing of an Act protecting all insectivorous birds from slaughter. Nature keeps up her balance of life; but when man comes in as an active agent of destruction, and recklessly kills the birds, the insects (which are kept in check by birds) will necessarily increase. In view of this, the true policy of this State is to preserve the birds—not only the prairie chicken, quail, and plover, but all insectivorous birds; and it must be remembered that even the water fowl which some would exclude from the action of the law, destroy insects which pass one stage of their existence on the water, and then come upon the land and work mischief to our agricultural interests. For instance, as regards snipe, I never opened the crops of those I have shot for examination, but, in every instance, I have found them full of the larva of insects and worms; and last summer I found their crops filled with the cottonwood beetle, to which Mr. Culbertson has directed attention. Again, also, there are no insectivorous birds of greater advantage to the state than the curlews. As regards the locust, the experience of the old world shows that they have not become localized where the rain-fall is not above 15 inches a year. In their native breeding places in the Rocky Mountains the rain-fall does not exceed 6 to 8 inches; and, whenever they leave their native *habitat* for the plains, there begins immediately a decadence in vitality. They lose in vigor themselves and they become the prey of parasites—nature's provision, which will ever prevent the plains from being their con-

stant breeding places, and a provision which is increasingly effective as the rain-fall increases by increase of cultivation. All that can happen here, therefore, is that the grasshopper will be an occasional visitor.

EXPERIENCE WITH THE GRASSHOPPER.

THE PRESIDENT: As to the grasshoppers, I think I may say this, that I would rather fight them than an ordinary crop of weeds; and with proper care they will do less harm. When there are young grasshoppers in the spring they may be fought successfully during the first ten days after hatching. During that period they do not eat much, but gather together in patches in warm sunny places where large numbers of them may be easily killed. When they begin to travel the best method is to ditch against them; and that plan, properly followed, will effect much good. The plowing out of the eggs—plowing them to the surface—so that the birds can pick them up is a good remedy; and, also, the deep plowing of the eggs under the ground, some observers regard as effectual in preventing any large and destructive hatching out of the insects, though I have found harrowing the most effectual operation.

LET THE BIRDS HAVE THE EGGS.

MR. BARNARD: When we have grasshopper eggs deposited anywhere in the country I would say let the land be deep plowed early in the spring; and then harrowed so as to break up the cocoons and throw them to the surface. When this is done the birds make good work among the eggs. I have done this, and then—sometime after the first harrowing—gone over the ground again; but have found few or no eggs. The birds are our best friends in the destruction of these and other insects; and the law ought to prevent them from being killed. I have noticed that the quail does excellent service; and the crow is a good scavenger, taking grasshoppers' eggs by a cocoon at a time. When we have young grasshoppers I consider that the best remedy is ditching, making the ditch 16 inches wide by 20 inches deep, and driving the young grasshoppers into the ditch where they can not escape, and where they can be killed with a sprinkling of kerosene.

THE QUICK LITTLE SNOW BIRD.

MR. MADISON: Among our good friends I number the little snow bird—so active and common with us in the fall and winter. When grasshopper eggs have been laid in the ground, and the land has been dragged over and the eggs thrown to the surface, one of our common flocks of snow birds will pick them all up.

GRASSHOPPER EGGS A SNOW BIRD FEAST.

MR. BARNARD: I am as well satisfied as Mr. Madison with the value of the snow bird. When in any piece of ground the eggs of the grasshopper are laid, and these are brought to the surface, the snow bird will destroy ninety-nine hundredths of them. I am also friendly to the skunk. He will not only eat the eggs; but, when grasshoppers come into the country, he will fill himself full of them.

THREE TIMES ITS OWN WEIGHT A DAY'S FOOD.

PROF. AUGHEY: As regards the little snow bunting so abundant with us in winter, according to Coues he will eat three times his own weight in twenty-four hours, and he weighs three ounces.

GOOD CULTIVATION WILL KEEP DOWN INSECTS.

MR. BARNARD: I believe that systematic work in cultivation will greatly reduce insects. There is the tent caterpillar, for instance, of which during the past year I have not found a single specimen in thirty acres of fruit trees and nursery stock. There are insects also which are to be regarded as our friends. We have the spined soldier bug (*arna spinosa*) which destroys multitudes of the eggs of obnoxious insects by sucking them. It does this with the eggs of the Tent caterpillar as I have frequently seen. As to the flat-headed borer, it will never be seen unless the bole of the tree has been allowed to sun-scald which, as we have seen in these discussions, can be prevented; and, as for the round-headed borer, these grow in the weeds and trash which some people allow to accumulate at the bottom of trees. There are small flies for which I have no name; and when I have found them on the bloom of the Transcen-

dent and Hyslop and some other standard trees, I have held a pan of burning sulphur below and they have left the tree. I should say this would also be a remedy against the curculio on the plum or peach.

LEANING TREES A PREVENTATIVE OF BORERS.

Referring to Mr. Stephens' recommendation to plant fruit trees leaning west of south,

MR. BARNARD asked MR. STEPHENS: Do you find that borers attack the boles as the effect of sun-scald?

MR. STEPHENS: When the sun-scald damages the bark, the tree is more subject to their attacks.

MR. BARNARD: But do they never attack trees which are not sun-scalded?

MR. STEPHENS: I think that when trees are planted with the lean I recommend, there is very little liability to them; but when the tree is damaged by sun-scald, it is very likely to be attacked.

MR. BUDLONG: How do you find trees which are, say 12 years old? Sometimes the borer in such trees attacks the trunk quite at the ground.

MR. STEPHENS: There is another kind of borer—the borer which attacks the forks of the limbs, and these should be watched for, and picked off.

MR. JENKS: That is my experience.

MR. O. PARKER: That has been my experience. When I discovered that limbs were falling over which had been subject to the borer, I watched for the insect pretty close through the fall and winter, and since then they have not done me any harm. The insect deposits its eggs in the fall, just when the leaves begin to dry. I did not know what ravages these insects did; but I imagined that they bored in the forks of the limbs, and since I have carefully picked them off, I have not been bothered by these limb borers. To prevent sun-scald, and the consequent attacks of borers, I think the idea of Mr. Stephens a good one.

GENERALLY AS TO INSECTS.

MR. STEPHENS: The only one of the common enemies to fruit with which we are troubled in Saline county, is the flat-headed

borer; and, as sun-scalded trees are most liable to their attacks, for this reason I strongly recommend the leaning of trees so as to protect the boles, and save the tree from sun-scald. But, if the insects get into the trees, the eggs can be destroyed by washing the trees twice with a strong lye, between the middle of May and July or August. The trees that are shipped into the State have little root, and have suffered from sun-burn, and therefore invite attacks. If a flight of grasshoppers come into the country, they may be kept from alighting in orchards by keeping up smudge fires—smoking them; but when they have alighted in an orchard or nursery, smoking will not do, they must be driven out by beating. In dealing with the eggs, the best remedy is that suggested by Mr. Barnard and the President.

INSECTS NOT DISCOURAGING IN SALINE COUNTY.

THE PRESIDENT: Have you found insects in Saline county at all discouraging to fruit culture?

MR. STEPHENS: I have not. Some of my neighbors complain of the tree-borer; but, though I have large orchards and nurseries, I am troubled but little by the tree-borer, and not at all by the twig-borer.

NEBRASKA A BETTER FRUIT STATE THAN ILLINOIS.

THE PRESIDENT: Mr. Barnard, I wish to ask you this question: Taking all the insect ills to which we are subject into consideration, what is your opinion of the advantages and disadvantages of Nebraska to the pomologist as compared with older States?

MR. BARNARD: I consider our advantages are most decided. I had had a large experience as a nurseryman before I came here; and I have never seen in Illinois trees as thrifty, and as free from all kinds of vermin as they are here. I have never seen here the bark-lice, so common in Illinois; nor trees covered with mildew as they are there. I would not have settled here if I did not believe this to be a fruit country. You have had 21 years' experience in the State, what dangers have you found?

THE PRESIDENT: For three or four seasons the codlin moth to some extent, but nothing discouraging. In regard to insects, there is nothing in Nebraska to discourage the fruit-grower.

HABITS OF THE TREE BORER—METHOD OF KEEPING IT FROM THE TREE.

MR. MADISON: The tree-borers leave the tree in August or September, after being two seasons in it; and in our county—as I found when on a tour of inspection with Mr. Donohue and Mr. Masters—I found that many good orchardists tie two or three thicknesses of ordinary brown wrapping paper about two hands wide, 8, 10, or 12 inches from the ground. When the insects attempt to go back into the tree they lodge between the folds of the paper, and in this way many of them are destroyed. Mr. Masters was using this paper effectually against the codlin moth.

A PAPER WRAP GOOD AGAINST THE CODLIN MOTH.

THE PRESIDENT: The grub of the flat-headed borer comes out of the tree early in the spring at the end of its third year. It passes three or four weeks in the pupa state in the ground, and then the insect emerges, probably after the first of May, being able to fly and not limited to crawling. It deposits its eggs in the boles of diseased trees; and the paper is a protection. It would be no protection against the round-headed borer, but it seems to be efficient against the codlin moth.

MR. STEPHENS: We have not the canker worm to contend with; but I think, if we had, wrapping the tree with paper would be a protection against these insects.

THE COTTONWOOD BEETLE.

MR. JENKS: Mr. Pratt, a neighbor of mine, has noticed the working of an insect in his cottonwood trees, of which he has several large groves. He tells me he has not been able to learn what the insect is; but, in regard to its operations, he says that they do not affect, so as to hurt, the trees that stand well apart, though they have done some mischief to trees which are planted close together.

MR. ROBERTS: In the neighborhood of Lincoln, the cottonwood beetle has done some mischief in cottonwood groves, where the trees are planted thickly together.

MR. STEPHENS: What is this beetle? We have not seen it in Saline county. Does it work on the foliage?

MR. ROBERTS: I have not examined it sufficiently to give any description of it. It is, however, something like the potato beetle; and it eats the foliage. I have never seen any of the insects on detached trees, but only in groves.

PROFESSOR CULBERTSON, B.A.: For some distance round Lincoln this insect has been among the cottonwood groves. They come in the spring when the leaves appear, and they lay their eggs on the leaves—15 to 20 in a cluster—and, hatching out in the course of a few days, the young caterpillars feed on the lower limbs, traveling up the tree as they grow older. When about to pass into the pupa state, they attach themselves to the under part of the limbs, and appear to dry up. In the course of two weeks, the perfect insects are developed, which fly around and feed on the tender leaves and shoots on the top of the tree. Two years ago, they were not numerous in the spring, but I observed more of them during the summer. In the course of the summer many of them disappeared; but still the insect is present, and the best remedy we have is in the constantly increasing numbers of insectivorous birds.

THE LEAF ROLLER NOT A NEBRASKA PEST.

MR. BARNARD: Professor Aughey, what is likely to be the outcome of the leaf roller of the apple tree? I fail to see much harm they do here; but it may be that sometime there will be more of them.

PROFESSOR AUGHEY: I have never seen them largely developed in this State; but in my native valley in Pennsylvania, they become so bad as to denude the trees of leaves in neglected orchards. Of course, that may be the result here if insects are not kept down by the birds.

MR. STEPHENS: What is the small insect that works on the bloom of fruit trees, causing the petals to fall off.

PROFESSOR AUGHEY: There are many small beetles that work on the blossoms, and this is one.

BILL OF RIGHTS FOR THE BIRDS.

Having generally considered the topic under discussion, the Society took up specially the question as to whether the birds of the State should be protected beyond the law existing at the time,

and to what extent such protection should go. On this topic, the following discussion took place, and a resolution was passed as stated below.

OBJECT OF BIRD LEGISLATION.

THE PRESIDENT: In considering this matter as to the protection of birds in connection with the destruction of insects we have to remember that we are dealing with a practical and not a sentimental question. Our object is that due preservation of birds which shall keep the insect enemies of our agriculture in thorough check.* This is what we desire to accomplish; and to that end it is probable that some birds might be exempted from the operation of the protecting law. There is the prairie hawk, for instance, which will destroy more young prairie chickens than all their other enemies. I mention this because our operations should be directed to a practical end.

A FRIENDLY WORD FOR THE HAWK—HALF A LOAF BETTER THAN NO BREAD.

MR. BARNARD: I am a friend of the hawk even, and so my voice is in favor of the general protection of birds. The hawk is an enemy of rats, and rabbits, and mice, and he effects much more good in the destruction of these than harm in the destruction of chickens. I am, indeed, entirely in favor of a law which will protect all birds; but, as there is a strong feeling in some quarters against such a law—and as a portion of the legislature is made up of sportsmen—I would recommend that we seek to obtain the best law under the circumstances, seeing that half a law will be better than none.

* In connection with this subject, the excellent address of Hon. James T. Allen, then President, delivered before the State Horticultural Society, at its annual meeting on March 1st, 1875, ought to be referred to. The advice, principles and considerations in that address contained, are worthy of always being borne in mind by the horticulturists of this State. In the course of his address, Mr. Allen put in a plea for the birds. In common with all enlightened horticulturists, he is for the preservation of birds, and to the sound economical reasons therefor—put forth in a few eloquent and well considered sentences—the experience of every season adds weight and strength.—R. W. F.

BUT MR. WINSLOW WANTS THE FULL LOAF.

MR. WINSLOW: I have had some experience in this bird killing business, and it seems to me that if the law is so drawn as to allow sportsmen one, two, or three months of the year in which to kill the birds, we shall not accomplish the object intended. To prohibit the killing of birds for part of the year, and allow them to be slain during the balance of the time—even if that time is limited still further than under the present law—why, just as many birds will be killed as ever there were. All that will happen will be, that the sportsmen will spend the whole of their time in hunting when the law allows the killing of birds. It might as well be said first as last, that the farmers demand the prohibition of killing altogether, and that demand has got to be conceded. I hope that the legislature will enact a measure prohibiting the killing of all birds, notwithstanding the opposition of the sporting clubs of the country. The farmers ought to be protected in this matter.

WESTERN FARMERS FAVOR FULL PROTECTION.

MR. BUDLONG: So far as the western part of the country—with which I am best acquainted—is concerned, it is almost the unanimous wish of every man that an entirely prohibitory law should be enacted—a prohibitory law covering the whole year. I have heard considerable expression of opinion on the subject; and, when I left home, I was instructed to inform our representative that he would be expected to work for it. We want a prohibitory law.

A FINE FLOCK OF GAME BIRDS—COMPETITION IN KILLING.

MR. STEPHENS: I have now on my place flocks of prairie chickens and quail, which will not number less than 700. I do not shoot these, and I carefully watch over them, and prevent them from being shot by others. I know by experience, that these birds are my friends; and they more than repay me for my care over them by the destruction of insects. I consider that the legislature ought effectually to protect our birds. The mere pleasure of the sportsman ought not to come in the way of the great agricultural interests of the State; and, therefore, I am in favor of a measure which

shall effectually protect our birds. The sporting club of Crete consists of twenty members. On the first day of the season they start on a grand hunt to see who can kill the most birds; and some of the best hunters will kill sixty a day from that time on, the birds, having been left alone nine months, being very tame, and easily killed. It will be best, if we can, to have a law prohibiting the killing of birds altogether; but, if that cannot be effected, then let the season be restricted to November and December.

DEAD BIRDS MEAN LIVING INSECTS.

MR. WINSLOW: The difficulty is here: if we have the birds killed at any time, why then we shall not have them to kill insects.

COURAGE OF INNOCENCE AND IGNORANCE.

MR. MADISON: In the month of August and the commencement of September, the prairie chickens are just large enough not to be afraid at all. They know no danger, and a sportsman has not much difficulty in killing a whole flock. If the close time were extended, and the opening of the shooting postponed—as suggested by Mr. Stephens—the birds would be older and wilder, and so much destruction would not be done among them.

A NEBRASKA FARMER WHO WOULD SPOIL THE STRANGER'S SPORT.

MR. J. M. MESERVE: For one, I require a law which will completely protect the birds—these best friends of man. It is not only our own sportsmen who make havoc among them, but people from Illinois, and even as far east as Boston, who come here, scour our prairies, and kill everything that gets within range of their guns. Last season a car came up from St. Louis, which was stopped on the Atchison and Nebraska railroad at Firth. This car brought twelve men, who had twenty-four dogs. They hunted the country thoroughly; killed every bird they could get; and their game was sent off by express. Strangers run over the country with light wagons, and dogs and guns, and destroy the birds. It is not the farmers who kill the birds; and the farmers require protection.

TRAPPING NOT WORSE THAN GUNNING.

PROFESSOR THOMPSON: The present law is solely in the interests of the sportsmen who kill more birds in one day than the farmers kill in the entire year. Under the present law the farmer who traps a bird in January is liable to prosecution; but there is no reason why birds should not be trapped in January than killed by the gun in December.

POPULAR SENTIMENT WILL SUSTAIN PROTECTION.

PROFESSOR AUGHEY: At the time prairie chickens are now permitted to be shot—the first of August—great numbers are not more than half grown, and many of them are scarcely able to fly. I consider, however, that the killing of birds should be prohibited altogether. The birds of the State perform a great economical service for the State, and should be preserved for the State; and to give any time at all for the killing of them is to abstract so much from the capital of the State. There is a strong popular sentiment which will sustain a strict protective law in the interests of our agriculture. If even a month's time is allowed for shooting, nothing will be accomplished, for the sportsmen will turn out during that month in such force as to work as much havoc as at present.

LEGISLATURE MEMORIALIZED.

On the motion of Mr. Winslow, a committee was appointed, consisting of Messrs. Stephens and Professors Thompson and Wilbur, to consider the matter; and these gentlemen reported a resolution in favor of a law protecting all birds destructive of insects which are injurious to agriculture. This resolution was unanimously adopted; and, in due course, it was communicated to the legislature then in session, and which legislature passed the bird-law, the substance of which is given in the note on page 94.

FRUIT LIST FOR NEBRASKA.

The Society considered with great care the subject of the Fruit List to be adopted for Nebraska, and endorsed by the Society. In the case of every individual variety, its qualities in all respects, and its adaptability to the soil and climate of Nebraska—as tested by experience—were thoroughly discussed, and the marks were given accordingly—the three stars for fruit best in all respects—adaptation, quality, and flavor; the two stars, as failing in some characteristic; and the single star, as worthy of cultivation in Nebraska, but not thoroughly tested. The discussion was long, but discursive. More or less, all the members took part in it; but it is best in this report to give the results arrived at rather than the discussion, it being observed that the list recommended was confined to such fruits as the Society could endorse. The varieties which are being tested by nurserymen only, were excluded, it being left to those gentlemen to complete their experiments, and arrive at definite results before reporting progress. Yet it was admitted that the work of the professional horticulturists is of exceeding great value to the horticultural interests of the State: they help forward the good work, and make horticulture scientific and certain; but at the same time, it was deemed best to leave them to this their proper work, and only attach the approval of the Society to the fruits the Society can recommend to farmers and unprofessional growers who propose to set out orchards on a scale more or less extensive.

SELECTED APPLE LISTS.

When the general list had been arranged, on the motion of Professor Williams, seconded by Mr. J. Moore, it was resolved to make up smaller lists for the benefit of those who only propose to have small orchards, and yet who desire to have a variety of fruit. These lists were confined to apples; and the selection was made by the President, the Society approving of the selections made. These lists the Society put forth as thoroughly and entirely reliable, in all respects, in Nebraska's soil and climate, the trees recommended being the best which the planter of a small orchard in Nebraska can adopt. The

SOCIETY'S LIST OF SEVEN

comprises two summer apples—the *Red June*, which produces an apple, the flesh of which is white, fine grained and tender; and *Cooper's Early White*, the flesh of which is sharp and sprightly to the taste. Two fall apples—*Maiden's Blush*, with flesh white, fine grained, tender and juicy; and *Fameuse*, with flesh snowy white, fine grained, tender, juicy, with a slight perfume; and three winter apples—*Rawle's Jennette*, flesh yellowish, tender, and a mild sub-acid flavor; *Wine Sap*, flesh yellowish, tender, juicy and sub-acid; and *Ben Davis*, with flesh whitish, tinged with red, juicy, sub-acid, and of a pleasant flavor. The

SOCIETY'S LIST OF TWELVE

comprises the addition of one summer apple—the *Red Astracan*, with white, crisp, acid flesh until fully ripe, when it is richly flavored. One fall apple—*Rambo* whose flesh is yellowish and rather coarse, and yet characterized as "very good." And three winter apples—the *White Winter Pearmain*, whose flesh is yellowish, tender, crisp and juicy, and of very pleasant mild sub-acid flavor; *Domine*, flesh white, tender and juicy; and *Talmon's Sweeting*, with flesh white, firm and very sweet.

GENERAL APPLE LIST.

The following are the apples for Nebraska, recommended by the marks thereto attached, which indicate the experience of horticulturists in Nebraska, as already set forth.* While the person who is

* At the March, 1875, meeting of the Society (Hon. J. T. Allen, of Omaha, being then President), the President, Hon. J. H. Masters, Hiram Craig and myself were appointed a committee to revise the list of fruits recommended for general cultivation, and instructed to report only those varieties which had been thoroughly tested, and had proved successful. The committee reported a list of fruits which was duly published, the committee also uniting in urging the planting of large orchards of apples which are our great fruit staple. The list given in these pages does not supersede the list of 1875. That list was carefully considered by the committee; and it was the order of the Society to incorporate into this report such fruits of the 1875 list not specially passed on at the 1877 meeting. Perhaps the order will be best carried out by bringing these fruits into a note, and it is done accordingly, it being premised that in the 1875 list the fruits are generally recommended as the kinds "most desirable for profit, combined with excellence of quality." Apples in the 1875 list not passed on in 1877, with the

beginning to grow fruit in Nebraska, and who proposes to content himself with a small orchard will, with ordinary care, be certain of success with the selected list, those who propose having large orchards can secure their varieties by selection from the following:

SUMMER APPLES FOR NEBRASKA.

*** *Buffington's Early*.—A reliable grower. Fruit below medium, but with delicate, tender, sub-acid flesh.

*** *Carolina Red June*.—This tree, which is a vigorous grower, comes into bearing in 5 to 7 years; and it produces abundantly.

*** *Cooper's Early White*.—A tree which grows well, and bears well, and especially so in new, warm soil, which has a proportion of sand. It comes into bearing in 5 to 7 years in Nebraska. The fruit is medium, of a pale yellow, with a faint blush.

MR. MOORE: The tree is a magnificent bearer, and produces a most beautiful apple. The fruit is so beautiful, as grown in Nebraska, that, at the Exhibition at Philadelphia, they charged me with having had the apples varnished.

MR. STEPHENS: It grows well, and Mr. Perry Walker, of Platts-mouth, thinks it the most profitable market apple. The fruit is ready early in August, and holds on until September.

MR. BARNARD: It grows a nice thrifty tree.

*** *Duchess of Oldenburgh*.—A vigorous tree, productive, and

characteristics as given in that list: *Sweet Bough* (best early sweet) and *William's Favorite*.—Autumn Apples: *Bailey Sweet* (best fall sweet apple), *Drap d'Or* (very hardy), *Gabriel* (one of the very best); *Hubbardston Nonesuch* (good bearer); *Jersey Sweet* (hardy and reliable); and *Peck's Pleasant* (good quality and reliable).—Winter Apples: *Clyde Beauty* (excellent for early winter), *Esopus Spitzenberg*, *Jeniton* (good in all respects), *Northern Spy*, *Perry Russet* (very profitable), *Red Detroit* (hardy but slow bearer), and *Swaar*.—Crab Apple: *Hewes*.—Autumn Pears: *Buffum* (erect, strong grower and bears well), *Buerre Bosc* (recommended by J. T. Allen), *Doyenne Boussouck* (strong grower), *Sheldon* (does well), and *White Doyenne* (prolific bearer).—Winter Pear: *Beurre de Anjou* (best winter pear).—Cherries: *Belle Magnifique* (very successful), *English Morello* (very profitable), *Reine Hortense*, *Royal Duke* (satisfactory) and *May Duke*.—Plums: *Jefferson*.—Peaches: *Crawford's Early*, *Crawford's Late*, *Early York*, *George IV.*, *Hale's Early*, *Smock*, *Stump the World*, *Froth's Early*, *Morris White*, and *Ward's Late*.—Apricots: *Breda*, *Early Golden*, *Hemskirke*, *Moorpark* and *Peach*.—Grapes: *Iona*, *Ive's Seedling*, *Martha*; and Mr. Allen stated he had seen the following fruited successfully: *Crevelling*, *Eumelan*, *Goethe* (Roger's Hybrid) and *Salem*.—Strawberries: *Ellsworth* and *Agriculturist*.—Gooseberries: *Cottage Girl* and *Whit-smith*.—R. W. F.



RUSSELL RICHARDSON SC.

ON TURKEY CREEK, SALINE CO., NEB.

the fruit valued for cooking and for the market, coming into bearing in 7 to 9 years.

****Early Joe*.—Hardy, and thrives in a rich, strong soil. Fruit not quite medium, with tender, delicate flesh, having a pear flavor.

****Red Astracan*.—This tree is hardy, and a strong grower, and comes into bearing in 7 to 9 years.

MR. WINSLOW: This is one of our thriftiest trees.

****Summer Queen*.—Hardy, and early bearer, but fruit not the best; fruit something less than large, and flesh juicy, sub-acid and aromatic.

***Early Pennock*.—Thrifty and hardy, and early and prolific bearer, coming in bearing from 7 to 9 years, but fruit second rate.

***Sweet June*.—Productive, and comes into bearing in 9 to 11 years. Fruit fine and sweet, and good for baking and eating.

**American Summer Pearmain*.—The tree requires deep, warm soil; fruit medium, fine grained, tender and sub-acid.

**Benoni*.—Of vigorous growth, with medium fruit; with flesh yellow, crisp, tender and vinous, coming into bearing from 7 to 9 years.

**Early Harvest*.—This is a tree usually esteemed; but it is not very productive. It comes into bearing in Nebraska, from 7 to 9 years. The fruit is medium, white, tender and juicy.

THE PRESIDENT: In different parts of the State there is a good deal of variation in the time this variety comes into bearing, and in the quality of the fruit.

**Tetofsky*.—Tree stout, and a regular bearer, and in quality like the Red Astracan. Flesh with an aromatic taste, and white, juicy, and slightly acid.

MR. STEPHENS: Its good body of fruit and extreme richness render it worthy of cultivation.

AUTUMN APPLES FOR NEBRASKA.

****Fameuse*.—This tree is considered well adapted to all northern sections; and, though the fruit is not ranked as of the highest character, it is a yearly producer.

*** *Maiden's Blush*.—A rapid grower, with fruit medium to large.

MR. MOORE: It is one of the most glorious apples we have.

*** *Rambo*.—A good grower and bearer, and in much repute in many places.

MR. STEPHENS: It is not hardy in the nursery.

MR. JENKS: It is generally with me.

THE PRESIDENT: That is not my experience.

** *Fall Wine*.—A slender, slow growing tree, but healthy; and develops well on the rich western soils. Fruit medium to large, with yellowish, juicy, tender and delicious fruit.

MR. WINSLOW: The tree is remarkably hardy.

MR. STEPHENS: Mr. Masters speaks highly of it.

** *Hawley*.—A hardy tree, but not a good bearer, though the quality of the fruit is of the best—tender, juicy and sub-acid, and the fruit large.

* *Porter*.—Tree of regular, slow, and slender growth, and a reliable bearer; fruit medium to large, the flesh being fine grained, juicy, firm but tender, acid.

MR. BARNARD: I would like to see the Porter recommended.

THE PRESIDENT: It is next to the Bellflower in quality; but we have not yet had sufficient experience with it.

* *Pumpkin Sweet*.—A baking apple, but not in high esteem; The fruit is large, and flesh white, tender and sweet.

WINTER APPLES FOR NEBRASKA.

*** *Ben Davis*.—A vigorous grower, and constant and abundant bearer; fruit large, flesh mild, sub-acid, with pleasant flavor.

*** *Domine*.—Strong and vigorous grower, with fruit medium to large.

*** *Jonathan*.—Tree slender, with pendent habit; fruit medium, with tender, juicy, slightly acid flesh, and yellowish white in color.

*** *Milam*.—A constant bearer; fruit small to medium, of sub-acid character.

*** *Perry Russet*.—Hardy tree, upright in habit; bears abundantly, a medium fruit, the flesh being firm, juicy and brisk sub-acid.

*** *Rawle's Jennette*.—This tree is rather tardy, and the fruit is medium to large, and abundant.

*** *Rome Beauty*.—Thrives in rich, warm, loamy soil; fruit large, crisp of flesh, mild and sub-acid.

*** *Roman Stem*.—Fruit medium; and flesh tender, juicy and sub-acid.

*** *Talmon's Sweeting*.—Tree rapid growth, good bearer, and hardy, with fruit of medium size.

*** *Wagener*.—Thrifty, fruit medium, flesh fine grained, crisp and juicy.

*** *White Winter Pearmain*.—A desirable apple; tree thrifty, but not a rampant grower; fruit larger than medium; and flesh tender, juicy and pleasant, with a mild, sub-acid flavor.

*** *Wine Sap*.—Tree hardy, early, productive bearer, with medium-sized fruit; and has proved in Nebraska one of the best apples.

** *Grimes' Golden Pippin*.—Of vigorous and hardy growth, and productive; fruit medium to large; flesh yellowish white, sub-acid.

** *Little Red Romanite*.—Comes into bearing in 6 to 9 years, and the tree is a good bearer. The flesh is yellow, firm and juicy, and the fruit keeps well.

** *Willow Twig*.—This is a good tree for the orchard on rich bottom lands. The tree yields well, and the fruit keeps well. The fruit is medium to large; and the flesh, which is rather dry, is mild sub-acid in flavor. Comes into bearing in 5 to 8 years.

* *Fulton*.—Fruit medium; flesh tender, juicy, mild and sub-acid.

CRAB APPLES.

Three stars were given to the *Transcendent*, and also *Hyslop's Crab*, these having been found remarkably well adapted to Nebraska—hardy, thrifty and prolific bearers.

PEARS FOR NEBRASKA.

*** *Bartlett*.—Vigorous grower; fruit clear, light yellow, with a

blush on the sunny side; flesh yellowish white, melting, juicy, vinous.

THE PRESIDENT: No one will doubt that the Bartlett should have three stars in Nebraska.

*** *Belle Lucrative*.—Moderate growth, and productive bearer; fruit medium; flesh melting, juicy, aromatic, sweet.

THE PRESIDENT: The Belle Lucrative does well with me.

MR. JENES: It does well in our county.

MR. MOORE: That and the Duchess are the most successful pears I know.

*** *Doyenne d'Ete*.—A moderately vigorous tree, with rather small fruit; and though the flesh is somewhat coarse, it is buttery, juicy, sugary and sprightly.

THE PRESIDENT: I regard this pear as the best of our early pears.

*** *Duchess d'Angouleme*.—A valuable variety, producing large and good fruit, and flesh white, buttery and juicy.

MR. BARNARD: Give it the highest diploma.

*** *Flemish Beauty*.—Succeeds well on rich soil; fruit large; flesh not fine grained; but juicy, melting and sugary.

THE PRESIDENT: The Flemish Beauty has done well with me.

MR. BARNARD: And it has done well in Pawnee county.

*** *Howell*.—Tree vigorous and productive; fruit large; flesh with a delicate aroma, melting, juicy, and slightly acidulous.

THE PRESIDENT: This is a rich pear, with thin skin, and it has done well with me.

*** *Lawrence*.—An abundant bearer, and desirable in the orchard; fruit above the medium size; flesh juicy and sugary, and gritty at the core.

THE PRESIDENT: I have succeeded well with this pear, and several others have fruited it.

MR. STEPHENS: It is hardy.

*** *Louise Bonne de Jersey*.—Tree hardy and productive; fruit large; delicious flesh, white, juicy, melting.

*** *Osband's Summer*.—Fruit rather small, but flesh white, tender, juicy and sweet, and a little astringent.

MR. BARNARD: That is one of our best pears.

THE PRESIDENT: So it is; I have tested it.

*** *Seckel*.—A slow growth, but worthy of culture; fruit small; flesh aromatic, sweet, juicy, buttery.

*** *Tyson*.—Of upright and strong growth, and hardy and prolific. Fruit less than medium, and flesh white and fine grained, sweet, juicy and aromatic.

** *Beurre Giffard*.—Hardy, with medium sized, pale yellow russet fruit, with flesh sweet, melting and aromatic.

** *Bloodgood*.—A rich, early, regular bearing pear, the tree being a moderate grower. Medium fruit, and flesh coarse, and a little gritty, though melting and juicy.

** *Vicar of Winkfield*.—Tree a vigorous grower; fruit large, and flesh juicy and sprightly.

* *Beurre Diel*.—Vigorous tree; fruit large; flesh rather coarse; but with a pleasant bouquet, and juicy and melting.

* *Rostiezer*.—Tree strong and upright grower; fruit less than medium; flesh with a bouquet; and juicy, melting and sweet.

* *Tyson*.—This is a vigorous grower; fruit below medium; but the flesh white, aromatic, melting, juicy and sugary.

CHERRIES FOR NEBRASKA.

The experience of horticulturists and farmers all over the State is, that cherries grow and fruit marvelously well in Nebraska. The kinds recommended and marked by the Society with three stars each, are the *Early Richmond* and the *Late Richmond*, the latter coming into bearing a little later than the former.

PLUMS.

Without attaching any marks thereto, the plums named at the meeting were the *Gages*—green, yellow and brown—the *Lombard*, the *Minor*, and the *Wildgoose*. The excellent wild plums of the prairie creeks were remarked upon; and it was suggested that some of the best should be domesticated, as indeed has been frequently done, with the best results. The practice of attacking

the curculio with fowls and young shotes was also highly commended.

PEACHES.

THE PRESIDENT (after a short discussion): We are not sufficiently informed by experience, or otherwise, to recommend a list of budded peaches; but the success we have had has been most gratifying with seedling peaches.

QUINCES.

THE PRESIDENT: I have been trying for 21 years to raise quinces in Nebraska, but I have not succeeded.

GRAPES FOR NEBRASKA.

The grapes recommended, and given three stars—being such as cannot fail to succeed with the slightest care—are the *Concord*, the *Delaware* and the *Hartford Prolific*. Many other varieties are successfully raised; but these the Society recommend to all planters.

GOOSEBERRIES.

*** *Houghton's Seedling*.

CURRENTS.

Mentioned but not marked: *Red* and *White Dutch*, *White Grape*, *Victoria*, the general experience (as shown *ante*), not having been generally satisfactory with the currant.

RASPBERRIES

Named: *Miama*, *Doolittle Improved*, *Philadelphia*, and *Ohio Ever-bearing*.

BLACKBERRIES.

Lawton, *Kittatinny* and *Early Wilson* recommended.

STRAWBERRIES.

Wilson's Albany, marked with three stars, and *Green Prolific* recommended.

PROPOSED GEOLOGICAL SURVEY OF NEBRASKA.

The last business transacted at the February, 1877, meeting, was a brief consideration of the matter which had been suggested by Professor Wilbur—the proposed law for effecting a geological survey of the State which was at the time under the consideration of the legislature. The opinion of the Society was entirely in favor of the law, it being considered that the accurate information which would thus be obtained as to the natural conditions and resources of the State would be of the most essential service in promoting its agricultural interests—those great interests on which the welfare of Nebraska depends. The following preamble and resolution were adopted and duly communicated to the legislature:*

REASONS FOR THE SURVEY.

WHEREAS, there is a constant inquiry being made by correspondence, especially with our State officials, by residents at home and abroad, concerning our mineral resources and agricultural interests; and whereas, a thorough geological survey can best furnish such information, therefore, be it hereby

Resolved, That the Nebraska State Horticultural Society does hereby earnestly recommend the passage of the bill for a State Geological Survey, now being considered in our legislature.

* The Geological Survey Bill alluded to above, though it obtained a large amount of support, and passed several stages, failed in becoming law. The failure is, however, only temporary, the material advancement made by the State during the twenty-five years of settlement—in population, in cultivation, in industry—renders it prudent to have accurate account of the State's resources. It is probable that the legislature of 1879 will take up and complete the task which the legislature of 1877 began but did not finish. To Professor Aughey, of the State University, the State owes much for his large and largely unremunerated labor, in exploring the geology and general natural history of the country. But one man, however zealous, by his own unaided resources cannot achieve a work of this magnitude and perform it perfectly. The work is for the State; and, though postponed for the present, the State will undertake it. The bill which failed to pass at the late session was drawn by Professor Aughey; and it provided—first, for a mineralogical survey; second, for a hydrographical survey; third, for a natural history survey; and fourth, for a geological survey, with special reference to an examination of the various parts of the State for coal, it being probable that as we have underlying rocks of various geological ages which in other districts bear valuable beds of coal, these same rocks in Nebraska will, in some places at least, yield accessible coal also.—R. W. F.

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ERRATA.

Page 7, line 23, for *p. chickasa* and *p. permillo* read *p. chicasa* and *p. pumila*.

" 7, " 24, for *v. cardifolia* read *v. cordifolia*.

Page 11, line 6, for *gleditscha trancanthus* read *gleditschia triacanthus*.

" 11, lines 10 and 11, for *platanas occidentalis* read *platanus occidentalis*.

" 11, lines 26 and 27, for *a. americanus* and *u. ovalis* read *e. americanus* and *e. ovalis*.

" 11, line 30, for *r. aoreum* read *r. aureum*.

" 11, " 31, for *c. sencea* read *c. sericea*.

" 11, " 33, for *s. argenta* read *s. argentea*.

" 11, " 34, for *morus vuloa* read *morus rubra*.

Page 14, line 10, E. T. Lyon should be T. T. Lyon.

" 14, " 12, J. B. Yellowby should be J. B. Yellowley.

" 14, " 13, William Barry should be William Parry.

Page 15, line 8, J. B. Yellowby should be J. B. Yellowley.

Page 32, line 33, for Estima read Esteina.

Page 33, line 11, for Morillo read Morello.

" 23, lines 26 and 27, Miawa read Miama.

Page 46, line 17, S. O. Bassett read S. C. Bassett.

Page 51, line 29, Geo. McVay read Geo. McCoy.

Page 60, line 5, and page 66, line 18, James Moore read James M. Moore.

Page 92, line 23, Mr. Hall read Mr. Stolley.